

The Corporate Preference for Trade Secret

ANDREW A. SCHWARTZ*

Many inventions can be legally protected either by patent or by trade secrecy, and a conventional wisdom exists on how to select between them. This Article adds to that literature by showing that corporations should have an inherent preference for trade secret over patent for reasons relating to their legal form. Among them is the idea that corporations are perpetual entities and therefore perfectly suited to reap the perpetual returns that only a trade secret can offer. The Article also addresses the potential for a conflict between the inherent corporate preference for trade secret and the preferences of corporate managers, who may prefer patent for reasons of their own.

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I. INTRODUCTION

A new invention can often be legally protected in one of two ways, patent or trade secret. So, which to choose? The choice is important, as each method has its strengths and weaknesses. Patents offer strong protection and a positive “signal” to outsiders, but they are costly, require extensive disclosure and expire after twenty years.¹ Trade secret offers weak protection, as it provides no defense against reverse engineering or independent invention, but it costs nothing to obtain, avoids disclosure and can last forever.²

An established scholarly and practical literature enumerates and analyzes a number of relevant considerations in the choice between patent and trade secret, such as their duration, disclosure, and cost.³ But this conventional analysis totally omits one factor: the nature and identity of the party making the choice. Who is deciding between patent and trade secret? Is it a woman? A youngster? A corporation?

This Article asserts that the last of those questions—whether the deciding party is a corporation—affects the patent/trade secret calculus in important ways that the literature has not yet incorporated. Specifically, this Article claims that corporations, thanks to their legal nature, should have an inherent preference for trade secret over patent.

This corporate preference for trade secret can clearly be overridden by other considerations. For inventions that are designed for the mass market and are easy to reverse engineer (e.g., the Rubik’s Cube), secrecy is not possible and

¹ See *infra* Part II.A.

² See *infra* Part II.A.

³ See *infra* Part II.B.

patent is the only feasible choice.⁴ This Article ignores those easy cases and addresses itself to the common real-life situation where either patent or trade secret could be a realistic and sensible method of intellectual property (IP) protection under the conventional analysis.

The claim is this: a corporation should, because of its formal legal nature, favor trade secrecy over patent, at least in reasonably close cases. This corporate preference should be added to the literature as a material factor for inventors deciding between patent and trade secret. Material, as used here, is intended to mean important, though not necessarily decisive.⁵

The corporate preference derives from the legal characteristics that define the corporate form, including limited liability, centralized management and perpetual life.⁶ The argument, presented in Part III.A below, has four strands.

First, corporations are endowed by law and charter with perpetual existence, as this author has focused on in prior work.⁷ Human lives, in contrast, as well as non-corporate forms such as limited partnerships, are non-perpetual. Hence, the perpetual nature of the corporate form makes them especially well positioned to reach for the perpetual returns that only a trade secret can offer.

Second, because capital is “locked in” to a corporation, corporations have relatively little need to gather outside capital, and therefore undervalue the “signal” aspect of a patent. One important value of a patent for a firm is that it conveys a strong positive signal of the firm, which may in turn allow for a lower cost of capital from outside investors. But one of the distinctive features of the corporate form is that shareholders’ capital is locked in to the corporation and cannot be withdrawn. So the signal value is undervalued by corporate entities, thus depriving patent of one of its key advantages over trade secret, and tilting the scales toward secrecy.

Third, one of the advantages of patent is that licensing or selling a patent is easier and less expensive compared to a trade secret. But because corporations offer limited liability and centralized management, they can practice an invention “in-house” and avoid the relatively high transaction costs of alienating a trade secret entirely.

Fourth, one problem with trade secrets is that they are a highly illiquid asset; by contrast, a patent is much more liquid. But this problem can be solved by using the fact that shares in a corporation are themselves alienable under the law: shares of a corporation that holds a trade secret can act as tradable units

⁴ See *infra* Part II.B.

⁵ See, e.g., *TSC Indus. v. Northway, Inc.*, 426 U.S. 438, 449 (1976) (Materiality, under the federal proxy laws, “does not require proof . . . that disclosure of the omitted fact would have caused the reasonable investor to change his vote.” It is sufficient that “the omitted fact would have been viewed by the reasonable investor as having significantly altered the ‘total mix’ of information made available.”).

⁶ This Article uses the term “corporation” to refer to a for-profit business corporation, unless otherwise noted.

⁷ See Andrew A. Schwartz, *The Perpetual Corporation*, 80 GEO. WASH. L. REV. 764, 768 (2012) [hereinafter Schwartz, *Perpetual*].

based on the value of the trade secret. This can ameliorate the alienability problem with trade secret, thus making trade secret relatively more attractive when deciding between it and patent.

The overall impact of these four considerations is that corporations should have a preference for trade secret over patent when deciding between them. Assuming the theory is correct, does this effect exist in practice? Do real corporations really prefer trade secret? A definitive empirical answer is impossible, because the nature of trade secrets is that they are secret. Unlike patents, for which there is an easily accessible public register, there is no comparable list or roll of trade secrets.

That said, the empirical studies that have been conducted are consistent with the theory of a corporate preference for trade secret, as discussed in Part III.B. In addition, Part III.C recounts the history of the first patent statute, which was enacted in Venice in the 1400s precisely because a corporate-like entity, the Murano glassmaking guild, employed trade secrecy so effectively. Like the empirical data, this historical evidence is suggestive and consistent with the idea that corporations, thanks to their legal form, should prefer trade secrecy to patent protection.

Finally, Part IV addresses the potential for a conflict of interest between corporate managers, who may prefer patent to advance their own interests, and the corporate preference for trade secret. For example, among venture capitalists, a high "patent count" is generally seen as a harbinger of success. It is therefore possible that managers controlled by VCs may impede their corporations from operationalizing the corporate preference for trade secret.

This Article makes at least two novel contributions to the corporate law and IP literature. First, it demonstrates that corporations, because of their legal nature, should prefer trade secret over patent. Second, it examines the agency costs of implementing that corporate preference.

The structure of this Article is as follows: Part II describes patents and trade secrets, and reviews the conventional analysis on making the choice between the two. Part III introduces and explains this Article's theory that corporations have an inherent preference for trade secret over patent, due to essential aspects of the corporate form, and briefly surveys empirical and historical data consistent with the claim. Finally, Part IV considers when and whether corporate management will be inclined to implement or thwart the corporate preference for trade secret.

II. THE CHOICE BETWEEN PATENT AND TRADE SECRET PROTECTION

This Part introduces the law of patent and trade secret to the extent necessary to understand the remainder of the Article. After identifying the legal characteristics of both patent and trade secret, as well as briefly examining the social utility of each, it summarizes the conventional analysis for deciding between the two.

A. Intellectual Property in the Useful Arts: Patent and Trade Secret

Intellectual property (IP) law offers two alternative methods for protecting a novel and useful invention, patent or trade secret.⁸ A patent is an IP right issued by the federal government that confers on an inventor a twenty-year right to exclude others from making, using or selling her invention, on the condition that she carefully describe the invention in a publicly available written document.⁹ A trade secret is an IP right recognized under state law for valuable information that is kept concealed from competitors and the public.¹⁰ Both patent and trade secret offer an exclusive right over the invention, but the protection they offer differs in important ways.

1. Patent

A patent offers a domestic monopoly that gives the holder the right to exclude others from making, using, importing or selling the patented invention for a fixed term of years in a given geographic area.¹¹ Only new, useful, and non-obvious inventions are eligible to be patented.¹² A patent offers a monopoly “against the world,” including innocent infringers, independent inventors, prior users—everyone.¹³ Moreover, willful infringers may be subject to treble damages.¹⁴

To obtain a patent, the inventor submits an application to the U.S. Patent and Trademark Office, which is then rigorously reviewed by a federal patent examiner who decides whether it meets the “stringent requirements for patent protection.”¹⁵ The patent application must clearly describe and explain the

⁸ This discussion pertains only to “useful” or “hard” forms of intellectual property, as opposed to “soft” IP, such as literature and fine art. See Andrew A. Schwartz, *The Patent Office Meets the Poison Pill: Why Legal Methods Cannot Be Patented*, 20 HARV. J.L. & TECH. 333, 358–59 (2007) [hereinafter Schwartz, *Patent*].

⁹ See *id.* at 336–37.

¹⁰ See David D. Friedman et al., *Some Economics of Trade Secret Law*, 5 J. ECON. PERSP. 61, 61 (1991); see also UNIF. TRADE SECRET ACT § 1(4) (1979) (amended 1985) (defining a trade secret). While some scholars have opined that trade secrecy protection is a matter of contract or tort, see, e.g., Robert G. Bone, *A New Look at Trade Secret Law: Doctrine in Search of Justification*, 86 CALIF. L. REV. 241, 304 (1998), this Article follows Mark Lemley in holding that trade secrets are best conceived of as IP rights. See Mark A. Lemley, *The Surprising Virtues of Treating Trade Secrets as IP Rights*, 61 STAN. L. REV. 311, 353 (2008) [hereinafter Lemley, *Surprising*].

¹¹ See Schwartz, *Patent*, *supra* note 8, at 336–37. A separate patent must be obtained for each country in which the inventor wants protection, although this process has been streamlined to some extent by the Patent Cooperation Treaty. See James R. Cartiglia, *The Patent Cooperation Treaty: A Rational Approach to International Patent Filing*, 76 J. PAT. & TRADEMARK OFF. SOC’Y 261, 261–62 (1994).

¹² See 35 U.S.C. §§ 101, 103 (2006).

¹³ *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 490 (1974).

¹⁴ 35 U.S.C. § 284.

¹⁵ *Aronson v. Quick Point Pencil Co.*, 440 U.S. 257, 262 (1979).

invention so that the public (or at least those skilled in the relevant technology) can understand and make use of it, once the patent expires.¹⁶

The fixed term of twenty years is a matter of both constitutional and statutory law. Article I of the United States Constitution empowers the federal government to grant patent monopolies to inventors—but only for “limited Times.”¹⁷ Hence Congress may not authorize the Patent Office to issue patents with a perpetual duration, but rather must limit the patents to a fixed term. And this is precisely what Congress has done: the federal Patent Act currently provides for a twenty year term measured from the date a patent application is filed.¹⁸

There are two primary policy goals of granting patents to inventors. The first is to encourage innovation and technological progress by offering a valuable reward—i.e., a government-enforced twenty-year monopoly—to those who successfully invent something novel and useful.¹⁹ In the absence of such a reward, conventional economic theory predicts that society will produce too little technological innovation.²⁰

The second policy goal of the patent system is to increase the storehouse of knowledge.²¹ Innovation is commonly viewed as a cumulative process whereby each invention builds on the last: as Isaac Newton famously said, “[i]f I have

¹⁶ See 35 U.S.C. § 112 (“The [patent] specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.”).

¹⁷ U.S. CONST. art. I, § 8, cl. 8.

¹⁸ Since the founding of the United States, the term of the patent grant has slowly grown from fourteen years, to seventeen years, and now to twenty years. See Mark A. Lemley, *An Empirical Study of the Twenty-Year Patent Term*, 22 AIPLA Q.J. 369, 372–76 (1994) [hereinafter Lemley, *Empirical*]. The latter change is not as significant as the former, however, as the seventeen years was measured from the date the patent was granted, while the twenty years is now measured from the date the application was filed with the Patent Office. *Id.* at 375–76. So, in theory, were it to take an average of three years to prosecute a patent from start to finish (a not unreasonable estimate), the effective length of patent exclusivity would not have changed under the most recent amendment. In practice, however, the average effective length of the patent term has been actually increased under the twenty-year term by almost one year (253 days), a modest but material change. *Id.* at 385.

¹⁹ See U.S. CONST. art. I, § 8, cl. 8 (providing that Congress may only grant patents in order “[t]o promote the Progress of Science and useful Arts”); Schwartz, *Patent*, *supra* note 8, at 338.

²⁰ See Schwartz, *Patent*, *supra* note 8, at 338. The idea is that an inventor who spends time and money researching and developing her invention can be taken advantage of by free-riding imitators who do not have to recoup the sunk costs of R&D and therefore can undersell the original inventor. Anticipating this outcome, people will theoretically spend a suboptimal amount of time and money advancing the state of the art. The patent system, by granting a temporary monopoly to successful inventors, helps counter this tendency and provides an incentive to invent. *Id.*

²¹ *Id.* at 339.

seen further it is by standing on [the shoulders] of Giants.”²² Hence, secretive behavior by inventors in an effort to prevent free-riding may hinder technological progress. The patent system ameliorates this problem by requiring, as a “quid pro quo” for patent protection, that the inventor let the Patent Office publish a detailed description of the invention, so that the public may learn from it.

2. Trade Secret

Trade secret protection can be obtained for any commercially valuable information that is kept secret.²³ Thus, the range of intellectual property that can potentially be protected as a trade secret is virtually unlimited,²⁴ and includes both patentable matter, such as industrial processes,²⁵ as well as non-patentable matter, such as customer lists.²⁶ The present discussion, however, is limited to those inventions that are eligible for either type of protection, and therefore excludes customer lists and the like.

Unlike a patent, for which one must file a formal application with the federal Patent Office, there is no application process to obtain a trade secret. All that is required is that the holder of the trade secret takes reasonable precautions to prevent its disclosure.²⁷ Precisely what constitutes “reasonable precautions” is a frequently litigated issue and varies from case to case, but in general it can include locked doors, non-disclosure agreements, network encryption, password protection or other measures appropriate under the circumstances.²⁸

²² Letter from Isaac Newton to Robert Hooke (Feb. 5, 1675/6), in 1 THE CORRESPONDENCE OF ISAAC NEWTON, 1661–1675, at 416 (H.W. Turnbull ed., 1959).

²³ See UNIF. TRADE SECRETS ACT § 1(4) (1979) (amended 1985); ROBERT P. MERGES ET AL., INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE 37 (4th ed. 2007).

²⁴ 1 ROGER M. MILGRIM, MILGRIM ON TRADE SECRETS § 1.09 (2005); CATHERINE L. FISK, WORKING KNOWLEDGE 15 (2009) (“All that is required is that the information be secret, be valuable because of its secrecy, and be subject to reasonable efforts to maintain its secrecy.”).

²⁵ See 1 MILGRIM, *supra* note 24, § 1.09[7]; see, e.g., *Progressive Prods., Inc. v. Swartz*, 258 P.3d 969, 972–73 (Kan. 2011) (involving secret method of coating elbow pipes for pneumatic conveyance systems).

²⁶ 1 MILGRIM, *supra* note 24, § 1.09[7] (noting the “extensive litigation” over customer lists).

²⁷ UNIF. TRADE SECRETS ACT § 1 cmt. (“The efforts required to maintain secrecy are those ‘reasonable under the circumstances.’”); MERGES, *supra* note 23, at 37.

²⁸ DARIN W. SNYDER & DAVID S. ALMELING, KEEPING SECRETS: A PRACTICAL INTRODUCTION TO TRADE SECRET LAW AND STRATEGY 10–11 (2012); see, e.g., *id.* at 25 (reporting that chocolatier Mars “designs and builds its candy-making equipment within the company so outsiders never see the full process, and it blindfolds outside contractors coming in to make repairs”). For a fictional example of the extremes to which holders of trade secrets will go to maintain them, see ROALD DAHL, CHARLIE AND THE CHOCOLATE FACTORY (1964). The backstory to this celebrated children’s tale is that Willy Wonka, the eccentric owner of a chocolate factory, painstakingly developed over the years dozens of secret technologies to produce wonderful candies, *id.* at 14, 19, only to lose them to industrial

If, despite the precautions taken, the trade secret is acquired via improper means, state trade secret law will come to the aid of the holder and enjoin the misappropriating party from using or disclosing the secret.²⁹ "Improper means" include theft, bribery, breach of contract, espionage, and other wrongful behavior.³⁰

Trade secret law thus provides strong protection against wrongful actors, but it offers no defense against someone that discovers the secret by "fair and honest means," such as independent invention or reverse engineering.³¹ In this way, the monopoly offered by trade secret is much more fragile than a patent.³² It may lawfully be defeated through independent invention, reverse engineering, or other legitimate means.³³ And, once the secret is disclosed, it is lost forever.³⁴ On the other hand, if the secret is kept, trade secret law offers protection in perpetuity.³⁵

In other words, while a patent offers protection for a specified term of years, a trade secret has no built-in expiration date.³⁶ Rather, trade secret protection has a perpetual duration that lasts as long as the information remains

espionage. *Id.* at 19 ("All the other chocolate makers . . . started sending in spies to steal his secret recipes. The spies took jobs in the Wonka factory, pretending that they were ordinary workers, and while they were there, each one of them found out exactly how a certain special thing was made" then returned to their own factories, secret in hand.). After a while, Wonka ejected all his employees, locked the "great iron gates" and brought in workers that never left the factory grounds so that his new batch of secrets would remain inviolate. *Id.* at 21-22 ("And of course now, when Mr. Wonka invents some new and wonderful candy . . . [no]body else is able to copy it." *Id.* at 22). Wonka is aware that he will not live forever, though, so he holds a contest to select an heir with whom he can share his trade secrets before it is too late. *Id.* at 157. Of course, had Wonka's factory and IP been held by a perpetual corporation, such mortal considerations would not have arisen.

²⁹ See RESTATEMENT (FIRST) OF TORTS § 757 (1939). In addition, the federal government can also bring an action against an alleged trade secret thief under the Economic Espionage Act, 35 U.S.C. § 1832 (2006).

³⁰ UNIF. TRADE SECRETS ACT § 1(1). For example, in one celebrated case the defendant hired a photographer to fly over a facility then under construction so that it could sneak a peek at the equipment used in plaintiff's secret process for producing methanol. See *E.I. duPont de Nemours & Co. v. Christopher*, 431 F.2d 1012, 1013-14 (5th Cir. 1970). Although the photographers did not trespass nor violate any other law in flying over the facility, this was held to be improper means for obtaining the secret. *Id.* at 1015.

³¹ *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 476 (1974). To "reverse engineer" is to discover the secret of an invention by inspecting the final product. RESTATEMENT (FIRST) OF TORTS § 757.

³² See *Kewanee*, 416 U.S. at 490 ("Where patent law acts as a barrier, trade secret law functions relatively as a sieve.").

³³ *Id.* at 476.

³⁴ *FMC Corp. v. Taiwan Tainan Giant Indus. Co.*, 730 F.2d 61, 63 (2d Cir. 1984) ("A trade secret once lost is, of course, lost forever.").

³⁵ See RESTATEMENT (FIRST) OF TORTS § 757 cmt. a (unlike patent law, trade secret protection "is not limited to a fixed number of years").

³⁶ See Gideon Parchomovsky & Peter Siegelman, *Towards an Integrated Theory of Intellectual Property*, 88 VA. L. REV. 1455, 1495 (2002).

secret.³⁷ So, if the secret is kept and not honestly discovered by another, the holder's legal monopoly will persist forever.³⁸

This does not mean, of course, that any given trade secret will persist forever.³⁹ To the contrary, trade secret protection can cease to exist at any

³⁷ *E.g.*, *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 186 (1933) (he who “keep[s] his invention secret” may “reap its fruits indefinitely”); *Nova Chems., Inc. v. Sekisui Plastics Co.*, 579 F.3d 319, 327 (3d Cir. 2009) (“Unlike a patent monopoly, trade secret protections are theoretically unlimited in duration, lasting as long as the information remains a trade secret.”); *Panduit Corp. v. Stahl Bros. Fibre Works*, 575 F.2d 1152, 1160 n.8 (6th Cir. 1978) (holder of trade secret may obtain a “permanent ‘monopoly’ . . . forever”); *Am. Dirigold Corp. v. Dirigold Metals Corp.*, 125 F.2d 446, 452 (6th Cir. 1942) (observing that trade secret protection offers a “perpetual[] monopoly”); *Moore v. United States*, 194 U.S.P.Q. (BNA) 423, 432 (Ct. Cl. 1977) (“trade secret protection is . . . potentially perpetual” (citation omitted)); *Moore v. Regents of Univ. of Cal.*, 793 P.2d 479, 514 (Cal. 1990) (trade secret protection is “unlimited in duration”); *Glattly v. Air Starter Components, Inc.*, 332 S.W.3d 620, 643 (Tex. Ct. App. 2010); UNIF. TRADE SECRETS ACT § 2(a) (1979) (providing that actual or threatened misappropriation of a trade secret may be enjoined until “the trade secret has ceased to exist”); RESTATEMENT (THIRD) OF UNFAIR COMPETITION § 39 (1995) (trade secret protection lasts until “information is no longer sufficiently secret”); RESTATEMENT (FIRST) OF TORTS § 757 cmt. a (trade secret protection “is not limited to a fixed number of years”); 2 MILGRIM, *supra* note 24, § 8.02[6] (“trade secret protection is ‘perpetual’ (i.e., of indeterminate duration) until the matter becomes generally known”); JAMES POOLEY, TRADE SECRETS § 3.01[1] (2010) (trade secret protection provides a “potentially permanent advantage”); Michael Abramowicz & John F. Duffy, *The Inducement Standard of Patentability*, 120 YALE L.J. 1590, 1622 (2011) (“[T]rade secrecy rights are potentially infinite in duration.”); J. Jonas Anderson, *Secret Inventions*, 26 BERKELEY TECH. L.J. 917, 924 (2011) (recognizing the “potentially limitless life[span]” of trade secrets); Andrew Beckerman-Rodau, *The Choice Between Patent Protection and Trade Secret Protection: A Legal and Business Decision*, 84 J. PAT. & TRADEMARK OFF. SOC’Y 371, 407 (2002) (“Trade secret protection can potentially last forever.”); Dan L. Burk, *Protection of Trade Secrets in Outer Space Activity: A Study in Federal Preemption*, 23 SETON HALL L. REV. 560, 591 n.208 (1993) (trade secrets offer the opportunity for “perpetual income”); Ralph D. Clifford, *The Federal Circuit’s Cruise to Uncharted Waters: How Patent Protection for Algorithms and Business Methods May Sink the UCITA and State Intellectual Property Protection*, 73 TEMPLE L. REV. 1241, 1278 (2000) (state trade secret law offers “potentially perpetual protection”); Rochelle Dreyfuss, *Dethroning Lear: Licensee Estoppel and the Incentive to Innovate*, 72 VA. L. REV. 677, 738 n.217 (1986) (“[T]rade secrets that are not reverse engineered or independently discovered may exist perpetually.”); Dean C. Dunlavey, *Government Regulation of Atomic Industry*, 105 U. PA. L. REV. 295, 339 (1957) (trade secrecy offers an “indefinite monopoly”); Lemley, *Surprising*, *supra* note 10, at 352 (“[T]rade secrets . . . are protected for an indefinite term, until they are no longer secret.”); Parchomovsky & Siegelman, *supra* note 36, at 1495 (“[I]n principle, trade secrecy may last in perpetuity.”); *id.* at 1495–96 (trade secrets have a “potentially infinite duration”); Bradford L. Smith & Susan O. Mann, *Innovation and Intellectual Property Protection in the Software Industry: An Emerging Role for Patents?*, 71 U. CHI. L. REV. 241, 257 (2004) (the “period of exclusivity” afforded by trade secret law is “theoretically unlimited”).

³⁸ See *supra* note 37.

³⁹ See POOLEY, *supra* note 37, § 7.03[1][b] (“Most secrets . . . are mortal.”).

time.⁴⁰ But the important point is that trade secrets have the capacity to endure perpetually—a capacity that patents lack.⁴¹

There is essentially only one policy purpose behind trade secret law: the encouragement of innovation.⁴² This is identical to the first policy underlying patent law.⁴³ Trade secret protection offers a monopoly unlimited in time or

⁴⁰ See *Warner-Lambert Pharm. Co. v. John J. Reynolds, Inc.*, 178 F. Supp. 655, 665 (S.D.N.Y. 1959) (“A secret formula or trade secret may remain secret indefinitely [or it] may be discovered by someone else almost immediately . . .”); *Parchomovsky & Siegelman*, *supra* note 36, at 1496 (“[T]he successful continuation of trade secrecy is probabilistic. The protection may last forever, or end at any given moment.”).

⁴¹ The perpetual nature of trade secrets has at least two legal implications beyond those considered in this Article. First, the holder of a trade secret is entitled to a permanent and perpetual injunction barring a misappropriator from ever using her trade secret. See UNIF. TRADE SECRETS ACT § 2(a) (injunction may only be “terminated when the trade secret has ceased to exist”); see also *Wyeth v. Natural Biologics, Inc.*, 395 F.3d 897, 902–03 (8th Cir. 2005) (affirming a permanent injunction issued under the UTSA where the secret remained intact); *Glattly*, 332 S.W.3d at 643 (reversing thirty-year injunction as error and replacing it with a permanent injunction that barred misappropriators “from ever using” the secret). This appears to be a universal rule, though there is a split of authority on the related, but distinct, issue of whether the injunction may persist against the misappropriator once the secret becomes generally known. Compare *Shellmar Prods. Co. v. Allen-Qualley Co.*, 87 F.2d 104, 109–10 (7th Cir. 1936) (holding that a party who improperly acquired a trade secret may be permanently enjoined from using it, even if the information is now generally known), with *Conmar Prods. Corp. v. Universal Slide Fastener Co.*, 172 F.2d 150, 155–56 (2d Cir. 1949) (holding that a party who improperly acquired a trade secret may no longer be enjoined from using it once the secret is generally available). Second, the usual common-law rule that restrictive employment covenants must be limited in time and space is suspended when the covenant relates to a trade secret. The trade secret portion of the restrictive covenant may properly remain in effect forever. *E.g.*, *IDX Sys. Corp. v. Epic Sys. Corp.*, 285 F.3d 581, 585–86 (7th Cir. 2002) (while restrictive covenants under Wisconsin law must be “reasonable . . . [in] time and scope,” “[n]o Wisconsin decision of which we are aware requires temporal or geographic limits as a condition to the enforcement of a non-disclosure agreement for intellectual property”); *Larx Co. v. Nicol*, 28 N.W.2d 705, 712 (Minn. 1946); *Wiley v. Baumgardner*, 97 Ind. 66, 69 (1884) (“A restraint unlimited as to space has been held not unreasonable where the subject-matter of the contract was a trade secret.”).

⁴² See *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 484–85 (1974); *MERGES ET AL.*, *supra* note 23, at 37 (“[P]rotecting against the theft of proprietary information encourages investment in such information.”). An alternative theory underlying trade secret protection is premised on the violation of commercial mores. *Id.* at 38. While this alternative tort-based theory is “not explicitly about encouraging investments, it is plain that one consequence of deterring wrongful behavior would be to encourage investment in trade secrets. Hence, despite their conceptual differences, the tort and property/incentive approaches to trade secrets may well push in the same direction.” *Id.* At least one scholar has asserted that there is no theoretical justification for trade secret law. See *Bone*, *supra* note 10, at 304. This view has not been widely accepted, however. See, e.g., *Lemley, Surprising*, *supra* note 10, at 337.

⁴³ See *Kewanee*, 416 U.S. at 484.

space with its attendant potential to generate great wealth, thus providing a sweet reward for successful inventors.⁴⁴

In sharp contrast to patent law, however, trade secret does not require any disclosure to the public.⁴⁵ As such, trade secret law does not encourage the public dissemination of knowledge in the way that patent law does.⁴⁶ To the contrary, it may have the effect of bottling up knowledge and information even when it would be socially beneficial for it to be shared.⁴⁷

3. *The Public Interest Can Be Served by Either One*

Patents and trade secrets have strong policy foundations, and the public interest is served by both. Of course, there can be abuses and unfortunate outcomes on either side. For instance, so-called “patent thickets,” “blocking patents” and “patent trolls” are all widely seen as problematic aspects of the patent system.⁴⁸ And trade secrets are often viewed as nefarious things that should be minimized and avoided, if not banned outright, due to the lack of public disclosure.⁴⁹ These are difficult policy issues, and they will not be resolved here. For present purposes, it will be sufficient to understand that there is good reason to think that the public interest can be served, or disserved, by both forms of IP.

The critics of trade secret make a strong case. The idea is that the public is better served by patents, which disclose new inventions that become public property after twenty years, than trade secrets, which keep important advances in private hands, potentially forever.⁵⁰ Indeed, one of the originating motives of patent law is to try to stamp out any trade secrets that may exist, so that they may be brought to light and improved upon by others.⁵¹

⁴⁴ See Anderson, *supra* note 37, at 960 (referring to the profit potential of using a secret invention forever).

⁴⁵ See *Kewanee*, 416 U.S. at 484–85.

⁴⁶ Trade secret law clearly discourages the disclosure of new ideas to the public at large. It may, however, encourage the dissemination of knowledge among smaller groups of people, in particular those that are well positioned to exploit the idea. See *infra* text accompanying notes 62 to 65.

⁴⁷ But see *infra* text accompanying notes 62 to 65.

⁴⁸ See generally ADAM B. JAFFE & JOSH LERNER, INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT 56–77 (2004).

⁴⁹ See Bone, *supra* note 10, at 304 (arguing that “trade secret law should be narrowed” “due to the absence of a convincing normative theory capable of making coherent sense of trade secret doctrine”); see also Anderson, *supra* note 37, at 928–31 (examining the law’s “distaste” for trade secrecy as evinced both in patent doctrine and judicial rhetoric). See generally FISK, *supra* note 24.

⁵⁰ See Anderson, *supra* note 37, at 935 (noting “the accepted wisdom of patents as preferable to secrets”).

⁵¹ See Schwartz, *Patent*, *supra* note 8, at 339.

The forceps offers an infamous example of a patent-eligible invention that was kept as a trade secret “for more than a century.”⁵² This aid in childbirth, the first that could save both mother and baby, was invented in the seventeenth century by Peter Chamberlen.⁵³ The forceps was passed down as a family secret for three generations, and the secret did not get out to the public until the mid-eighteenth century.⁵⁴ During its tenure as a trade secret, the forceps surely helped save hundreds of lives. Had it been patented, it could have saved thousands or even millions.⁵⁵

So, there is good reason to oppose the idea that a patent-eligible invention may be legally maintained as a trade secret. Indeed, the Supreme Court was asked in 1974 to hold that federal patent law pre-empts state trade secrecy laws, on the theory that the latter’s perpetual duration and lack of disclosure “is in direct conflict with the Patent Laws, which have as a purpose the objective of obtaining public disclosure after a limited period of time.”⁵⁶ In the end, the Court found that “the extension of trade secret protection to clearly patentable inventions does not conflict with the patent policy of disclosure,” and held that state trade secret and federal patent law may comfortably co-exist.⁵⁷ Even so, the conventional wisdom of courts and scholars has long been that patents are much preferable as a matter of public policy.⁵⁸

Nevertheless, the IP literature also offers a robust defense of trade secrecy as advancing the public interest. This line of scholarship has offered a number of sound reasons to expect that trade secrets advance the public interest, or at least are not contrary to it, despite the lack of public disclosure.⁵⁹ For one thing, by granting a potentially perpetual monopoly, trade secrecy protection provides a forceful incentive to innovate.⁶⁰ Indeed, the incentive from trade secrecy may

⁵² See Atul Gawande, *The Score: How Childbirth Went Industrial*, NEW YORKER, Oct. 9, 2006, at 58, 61.

⁵³ See *id.* (“It looked like a pair of big metal salad tongs, with two blades shaped to fit snugly around a baby’s head and handles that locked together with a single screw in the middle. It let doctors more or less yank stuck babies out and, carefully applied, was the first technique that could save both the baby and the mother.”).

⁵⁴ *Id.*

⁵⁵ See Lorie Graham & Stephen McJohn, *Thirty-Two Short Stories About Intellectual Property*, 3 HASTINGS SCI. & TECH. L.J. 1, 49 (2011).

⁵⁶ *Kewanee Oil Co. v. Bicron Corp.*, 478 F.2d 1074, 1086 (6th Cir. 1973).

⁵⁷ *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 491 (1974).

⁵⁸ See Anderson, *supra* note 37, at 935 (observing that the law “attempts to influence inventors at the margins to patent rather than maintain trade secrets”).

⁵⁹ There are, of course, rebuttals, but I do not want to re-litigate this scholarly debate here. See generally *id.*; Bone, *supra* note 10, at 304; Lemley, *Surprising*, *supra* note 10, at 328. It is sufficient for present purposes to establish that trade secrecy can at least sometimes be at least as pro-social as patent law, because then a corporate disposition in favor of trade secrecy is not problematic.

⁶⁰ See *Kewanee*, 416 U.S. at 484 (trade secrecy, like patent, is “another form of incentive to invention”); Lemley, *Surprising*, *supra* note 10, at 330 (“Trade secrecy . . . gives the developer of new and valuable information the right to restrict others from using it, and therefore the prospect of deriving supracompetitive profits from the information.”).

be more powerful than that from patent, in part because trade secret offers the opportunity for potentially perpetual wealth, while patent is limited in time.⁶¹

And the primary critique of trade secrets—that they keep ideas bottled up, preventing others from building on them—turns out to be an oversimplification. While it is true that trade secrets cannot by their nature be shared with the public as a whole, trade secret protection does encourage private disclosure to employees, potential business partners and others, as Mark Lemley has persuasively argued.⁶² This is because trade secret protection allows one “to disclose the idea in precontractual negotiations, secure in the knowledge that the other side is not free to take the idea without compensat[ion,] . . . and therefore permits business negotiations that can lead to commercialization of the invention or sale of the idea.”⁶³ Also, “the legal protection trade secret law provides serves as a *substitute* for investments in physical secrecy that companies might otherwise make,” which are likely to be inefficiently elaborate and costly.⁶⁴ The upshot is that, despite the lack of public disclosure, “for certain types of inventions we may actually get more useful ‘disclosure’ at less cost from trade secret than from patent law.”⁶⁵

So, trade secrecy is not some sort of boogeyman to be avoided at all costs.⁶⁶ And patents have plenty of problems of their own. They can impede innovation, drive up the cost of consumer products, clog up the court system and be used oppressively.⁶⁷ For instance, a lawsuit was recently filed that accused certain patent-holders of extortion and racketeering.⁶⁸

In conclusion, patent is not perfect, and trade secret has at least some merit.⁶⁹ Therefore, a corporate preference for trade secrecy over patent appears not to offend the public interest.⁷⁰

⁶¹ Cf. LYSANDER SPOONER, THE LAW OF INTELLECTUAL PROPERTY (1855), *reprinted in* 3 THE COLLECTED WORKS OF LYSANDER SPOONER 139 (1971) (complaining that patent law offers “*partial protection . . . only for a brief period*; after which, it shall be a subject of free plunder by all,” and arguing in favor of a system of “perpetual property” in ideas, for then we would “doubtless have five, ten, twenty, or more times as many valuable inventions, as we now have”); Anderson, *supra* note 37, at 954 (“In certain cases, secrecy can encourage innovation where patenting cannot.”).

⁶² See Lemley, *Surprising*, *supra* note 10, at 332–37.

⁶³ *Id.* at 336–37.

⁶⁴ *Id.* at 333–35.

⁶⁵ *Id.* at 314; Anderson, *supra* note 37, at 945 n.155 (quoting Lemley, *Surprising*, *supra* note 10, at 314).

⁶⁶ Friedman et al., *supra* note 10, at 62 (arguing that “the common law approach to trade secrets appears to make good—even subtle—economic sense”).

⁶⁷ E.g., JAFFE & LERNER, *supra* note 48, at 56–77 (describing “The Dark Side of Patents”).

⁶⁸ Ashby Jones, *Cisco Calls Patent Trolls Racketeers*, WALL ST. J., Nov. 12, 2012, at B1.

⁶⁹ Anderson, *supra* note 37, at 920–21 (“[S]ecrecy offers several underappreciated [public] benefits.”).

⁷⁰ Furthermore, if allowing parties to obtain trade secret protection on patentable inventions really is contrary to public policy, then the practice should be banned, thereby

B. *The Conventional Analysis for Selecting Patent or Trade Secret*

Innovative individuals and firms that have developed a new invention may seek to patent it, or try to maintain it as a trade secret.⁷¹ Depending on the nature of the information and the nature of the industry, one option or the other may present itself as the obvious choice. For example, because the scope of trade secret law is much broader than that of patent law, some valuable information—like a customer list or a marketing strategy—may qualify as a trade secret but be ineligible for patent protection.⁷² In that case, trade secret protection is the only option. Likewise, some innovations are so simple to reverse engineer—such as the “Rubik’s Cube”⁷³—that secrecy would be futile; in those circumstances “patent protection is the only meaningful protection.”⁷⁴

Yet there is a substantial realm of overlap where either trade secrecy or a patent could work to protect an owner’s exclusive use of valuable information, and a decision between these alternative forms of IP protection must be made.⁷⁵

mooting the patent/trade secret decision entirely. Such a ban, however, is unlikely to become law. See *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 494 (1974) (Marshall, J., concurring in the result) (the fact that “[s]tate trade secret laws and the federal patent laws have co-existed for many, many years” shows that “Congress, in enacting the patent laws, intended merely to offer inventors a limited monopoly in exchange for disclosure of their invention,” rather than “withdraw[] any alternative possibility of legal protection for their inventions”).

⁷¹ The inventor may also develop a trademark and brand for the invention.

⁷² See Daniel C. Munson, *The Patent–Trade Secret Decision: An Industrial Perspective*, 78 J. PAT. & TRADEMARK OFF. SOC’Y 689, 690 (1996).

⁷³ See U.S. Patent No. 4,378,116 (filed Mar. 29, 1983).

⁷⁴ 2 MILGRIM, *supra* note 24, § 8.02.

⁷⁵ See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 731 (2002) (observing that an inventor may choose either “to patent an invention and disclose it to the public” or “exploit it in secret”); SNYDER & ALMELING, *supra* note 28, at 18. It must be acknowledged that in the *Kewanee* case, the Supreme Court implied that there is not really a choice to be made between patent and trade secret because any rational inventor of a patent-eligible invention would surely select patent over trade secret. *Kewanee*, 416 U.S. at 490–91 (asserting that the chances of an inventor selecting trade secret are “remote indeed”); accord *Painton & Co. v. Bourns, Inc.*, 442 F.2d 216, 224 (2d Cir. 1971) (Friendly, J.) (claiming it would be “fanciful” to suggest that an inventor might prefer trade secret to patent). This assumption, however, has been roundly criticized as inaccurate, beginning with Justice Marshall’s concurrence in *Kewanee* itself. See *Kewanee*, 416 U.S. at 493–94 (Marshall, J., concurring in the result); Bone, *supra* note 10, at 269 n.124 (“[M]ost commentators agree that the Court’s assumption was clearly mistaken.”); Friedman et al., *supra* note 10, at 63 (“This reasoning is incorrect.”); Munson, *supra* note 72, at 708 (the view of the *Kewanee* majority “is clearly not shared by many industrialists, or by many in the patent field”); James Pooley, *Top Ten Issues in Trade Secret Law*, 70 TEMP. L. REV. 1181, 1184 (1997) (“Anybody that actually practices intellectual property law, however, knows this is flat wrong.”); Lisa Larrimore Ouellette, Note, *Access to Bio-Knowledge: From Gene Patents to Biomedical Materials*, 2010 STAN. TECH. L. REV. N1, 113 n.250 (the *Kewanee* Court’s “assumption that patents will always be chosen over trade secrets is simply

An inventor cannot exploit both forms of protection.⁷⁶ Furthermore, because this choice is frequently encountered in the real world,⁷⁷ academics and practitioners have developed a well-established body of literature describing the considerations that should be taken into account when deciding between patent and trade secret protection.⁷⁸

This Part briefly recounts the factors that are conventionally viewed as the most important when making this choice. As will appear, the distinctions between the legal protection offered by patent and trade secret lead logically to the factors that are conventionally considered when deciding between the two.⁷⁹

1. Duration

The duration of an IP right is among its most important characteristics, and the obvious preference for an IP holder is for a long term, rather than a short one. This not only makes intuitive sense, but is supported by the fact that in all areas of IP, the legislature has been furiously lobbied to extend the term of protection again and again—and has obliged, to some extent. Originally, patent protection lasted fourteen years; it has since been extended to seventeen, and then to twenty years.⁸⁰ And copyright has famously been extended over time from twenty-eight to forty-two to fifty-six to life-of-the-author-plus-fifty, to

wrong"). Moreover, the Supreme Court has not hewed closely to this aspect of *Kewanee*. See, e.g., *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 155 (1989).

⁷⁶ See Parchomovsky & Siegelman, *supra* note 36, at 1494. Applying for a patent on an invention will necessarily reveal the secret because the Patent Act both requires that a patent application include an "enabling disclosure"—a full and clear description of the invention that would enable a "person of ordinary skill in the art" to make and use the invention, and calls for publication of the application regardless of whether the patent ultimately issued. See *supra* Part II.A. Hence, the two forms of IP protection are mutually exclusive, so an election must be made between them.

⁷⁷ See WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW* 294–333, 354–71 (2003) (reporting that "trade secrecy abounds even in domains of inventive activity in which patent protection is obtainable"); 2 MILGRIM, *supra* note 24, § 8.02[1] ("[T]his is a choice frequently encountered by enterprises."); SNYDER & ALMELING, *supra* note 28, at 18; Beckerman-Rodau, *supra* note 37, at 377 ("Patent and trade secret law can be viewed as alternative bodies of law for protecting certain types of inventions."); Munson, *supra* note 72, at 689; Note, *Patent Preemption of Trade Secret Protection of Inventions Meeting Judicial Standards of Patentability*, 87 HARV. L. REV. 807, 821 (1974) [hereinafter *Patent Preemption*] (observing that "there are situations in which an inventor with a clearly patentable innovation may prefer to rely on trade secret protection rather than to apply for a patent").

⁷⁸ E.g., SNYDER & ALMELING, *supra* note 28, at 18–21. See generally Beckerman-Rodau, *supra* note 37; Munson, *supra* note 72.

⁷⁹ See Elizabeth A. Rowe, *Introducing a Takedown for Trade Secrets on the Internet*, 2007 WIS. L. REV. 1041, 1050 n.34.

⁸⁰ See Lemley, *Empirical*, *supra* note 18, at 372–76.

life-of-the-author-plus-seventy years.⁸¹ Thus we can see that duration is a central consideration for holders of IP.

Patents and trade secrets have very different durations. Whereas a patent has a fixed term of twenty years, the duration of a trade secret is perpetual.⁸² “Given that a rational inventor would prefer perpetual protection rather than twenty years of protection,”⁸³ trade secret represents the “clearly superior” option on this score.⁸⁴ It should therefore come as no surprise to learn that many inventors select trade secrecy over patent specifically to obtain perpetual protection.⁸⁵

That said, because trade secrets are perpetual in the same way that corporations are—they “*may* last forever, or end at any given moment”⁸⁶—when choosing between them one must try to predict whether the invention will remain concealed for longer than twenty years.⁸⁷ And that prediction, in turn, largely depends on the likelihood that the invention will be reverse engineered or independently invented within that time frame.⁸⁸

⁸¹ See *Eldred v. Ashcroft*, 537 U.S. 186, 194–95 (2003); Editorial, *The Coming of Copyright Perpetuity*, N.Y. TIMES, Jan. 16, 2003, at A28. These may seem like long terms, but nineteenth-century abolitionist and legal theorist Lysander Spooner argued that IP protection should be perpetual. See SPOONER, *supra* note 61, at 135–65.

⁸² See *supra* Part II.A.

⁸³ Dan L. Burk & Brett H. McDonnell, *The Goldilocks Hypothesis: Balancing Intellectual Property Rights at the Boundary of the Firm*, 2007 U. ILL. L. REV. 575, 610.

⁸⁴ *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 494 (1974) (Marshall, J., concurring); see POOLEY, *supra* note 37, §3.01[5][b]; Bone, *supra* note 10, at 269 n.124; Clifford, *supra* note 37, at 1278 (asking rhetorically why an inventor would ever “settle for a relatively short-term patent when potentially perpetual protection is available under state law”); Dreyfuss, *supra* note 37, at 737–38; see also Herbert David Klein, *The Technical Trade Secret Quadrangle: A Survey*, 55 NW. U. L. REV. 437, 456 (1960) (referring to the patent term as a “relatively short span”).

⁸⁵ *E.g.*, *Kewanee Oil Co. v. Bicron Corp.*, 478 F.2d 1074, 1078 (6th Cir. 1973) (“Counsel for Kewanee frankly stated in the course of the arguments before this Court that one of the principle purposes of maintaining the secrecy of [its] inventions . . . as opposed to seeking patents under the Patent Laws would be to extend the commercial monopoly of the invention beyond the 17 years granted by the Patent Laws.”); *Progressive Prods., Inc. v. Swartz*, 258 P.3d 969, 973 (Kan. 2011) (“Neither Messenger nor his colleagues ever pursued patenting their product, because patents have a limited lifespan and become open to competitors at the expiration of the patent protection.”).

⁸⁶ Parchomovsky & Siegelman, *supra* note 36, at 1496.

⁸⁷ Friedman et al., *supra* note 10, at 63; *Patent Preemption*, *supra* note 77, at 822 (“[A]n inventor who believes his patentable secrets cannot be reverse engineered and can be kept from public exposure for longer than seventeen years might opt for trade secret protection . . . to extend his protection for longer than the patent term.”).

⁸⁸ See Parchomovsky & Siegelman, *supra* note 36, at 1496 (“For an annual probability of detection of 25%, the trade secret’s expected life is twelve years, rising to twenty-seven years for an annual detection rate of 17.5%.”).

a. *Likelihood of Reverse Engineering*⁸⁹

Some types of technology can be reverse engineered from even the most cursory examination. Mechanical and electrical inventions, in particular, are often easy to figure out by dismantling.⁹⁰ This ease of reverse engineering weighs in favor of patent, because trade secret protection will surely not last long.

Other inventions tend to be much more difficult, if not impossible, to reverse engineer.⁹¹ This is particularly the case in the chemical industry⁹²: it can be difficult to discover even the existence of a secret chemical formula, much less to reverse engineer the complex technology embodied within it.⁹³ Another area where reverse engineering can be quite difficult is with regard to industrial processes. Inventing or improving a machine within a private factory, for example, might lead to enormous gains in production efficiency, but be undetectable in the final consumer product. In cases like these, the calculus weighs against patent and in favor of secrecy, because there is little risk of reverse engineering bringing an end to the term of protection.⁹⁴

b. *Likelihood of Independent Invention*

Patent law provides a right to exclude that is good against everyone, including independent inventors. Trade secret law, by contrast, offers no protection against someone who develops the secret technology entirely on her own. Rather, the exclusive IP right offered by trade secrecy comes to an end if the secret technology is independently invented by a third party. And, to add insult to injury, a later independent inventor could obtain a patent on the invention and bar the original inventor from practicing what used to be her trade secret!⁹⁵ The effective duration of trade secret protection thus depends on whether and when a third party can be expected to independently invent the secret subject matter.

⁸⁹ Reverse engineering is defined as “starting with the known product and working backward to divine the process which aided in its development or manufacture.” *Kewanee*, 416 U.S. at 476.

⁹⁰ Munson, *supra* note 72, at 696.

⁹¹ *Pennock v. Dialogue*, 27 U.S. 1, 13 (1829) (“There are many inventions, the secret of which is not at once discoverable from an inspection of the thing invented. The inventor may keep that as long as he can.”); Munson, *supra* note 72, at 698.

⁹² Munson, *supra* note 72, at 697 (“The chemical art is the truly fertile ground for trade secrets.”).

⁹³ *Id.* at 697–98.

⁹⁴ *E.g.*, *Globe Ticket Co. v. Int’l Ticket Co.*, 104 A. 92, 93 (N.J. Ch. 1919) (explaining that owners of a barrel head press that “permitted an enormous increase in production” of successively numbered tickets decided that a “padlock [was] better than a patent”).

⁹⁵ See *W.L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 1550 (Fed. Cir. 1983); Bruce T. Atkins, Note, *Trading Secrets in the Information Age: Can Trade Secret Law Survive the Internet?*, 1996 U. ILL. L. REV. 1151, 1177.

Furthermore, history shows that ideas and inventions are often developed independently by more than one person, at about the same time.⁹⁶ Isaac Newton and Friedrich Leibniz, for instance, each independently developed calculus within a few years of one another.⁹⁷ This is called the “ripeness-of-time concept of invention.”⁹⁸

The expected delay before independent invention may depend on the nature of the relevant industry. In an industry full of competitors and potential profits, rivals might be induced to reverse engineer an invention even if the endeavor would be extremely laborious and expensive to undertake.⁹⁹ Similarly, in such crowded markets many different entities will likely be sinking resources into the same area of research and development, increasing the likelihood that a given invention might be independently discovered by more than one person or company.¹⁰⁰ Conversely, in a small market it might still be feasible to keep the invention secret for a long time. For this reason, the state of the market should be taken into consideration alongside the technological intricacy of the innovation to estimate how long a secret can reasonably remain as such.

In sum, if the inventor believes that it will be longer than twenty years before anybody else will independently develop her invention, then this would weigh in favor of trade secrecy.¹⁰¹

2. Disclosure

A patent application calls for significant disclosure of the invention, including the “best mode” for using it,¹⁰² and patent applications are published eighteen months after filing.¹⁰³ Thus a patent application freely shares with the world—including direct competitors—all the hard-earned knowledge that one has developed after spending a lot of time and money.

A patent application requires the inventor to submit “a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms” that any reasonably knowledgeable person could recreate the technology.¹⁰⁴ This disclosure is what makes the “embarrassment of an exclusive patent,” as Thomas Jefferson famously called the government-endorsed monopoly, worthwhile for the public.¹⁰⁵ Patent

⁹⁶ *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 490 (1974).

⁹⁷ MARGARET E. BARON, *THE ORIGINS OF THE INFINITESIMAL CALCULUS* 255 (2003).

⁹⁸ *Kewanee*, 416 U.S. at 490.

⁹⁹ See Beckerman-Rodau, *supra* note 37, at 393.

¹⁰⁰ *Id.*

¹⁰¹ Friedman et al., *supra* note 10, at 64.

¹⁰² 35 U.S.C. § 112 (2006).

¹⁰³ 35 U.S.C. § 122(b)(1)(A).

¹⁰⁴ 35 U.S.C. § 112.

¹⁰⁵ *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 10–11 (1966) (quoting Letter from Thomas Jefferson to Isaac McPherson (Aug. 13, 1813), in 6 *THE WRITINGS OF THOMAS JEFFERSON* 181 (H. A. Washington ed., 1854)).

applications are published eighteen months after filing, accessible in “printed, typewritten, or electronic form” to any interested citizen.¹⁰⁶ Thus a patent application freely shares with the world—including direct competitors—all the hard-earned knowledge that the inventor invested time and money to research and develop. What’s more, patents can often give competitors valuable insight into a corporation’s confidential strategy or provide competitors with enough information to “invent around” the patent, causing it to effectively expire early.¹⁰⁷

Trade secrets require no disclosure at all. The holder of a trade secret can exploit the invention monopolistically for an unlimited time. As discussed *infra*, firms sometimes choose to disclose valuable technology as a way to reduce information asymmetries and signal innovativeness to investors. This role aside, the fact that trade secrecy allows exclusive use without disclosure generally weighs in favor of trade secrecy over patents.

3. Signal Value

The possession of a patent—any patent—conveys a strong positive “signal” to outsiders, regardless of the technical merit of the actual invention.¹⁰⁸ This insight, theorized by Clarisa Long in 2002,¹⁰⁹ and confirmed empirically in a major 2008 study by the University of California, Berkeley School of Law,¹¹⁰ suggests that a patent signal conveys credible, positive information to potential investors and therefore can lower the cost of capital for the patent-holder.¹¹¹ In sharp contrast, trade secrets can never act as signals because they are not shared with outsiders. Indeed, they are the opposite of a signal. Hence, this difference in signaling value generally weighs in favor of selecting patent protection.

The concept of signal value is based on the premise that investors as a class surely “prefer firms with higher R&D output to those with lower R&D output,” but it is difficult to accurately assess, from the outside, which is which.¹¹² Firms can, and do, engage in advertising efforts to convey information about their R&D.¹¹³ But these sorts of self-marketing measures are sure to be greeted with well-founded skepticism in the marketplace.

¹⁰⁶ 35 U.S.C. § 10.

¹⁰⁷ Beckerman-Rodau, *supra* note 37, at 395.

¹⁰⁸ See Clarisa Long, *Patent Signals*, 69 U. CHI. L. REV. 625, 627 (2002).

¹⁰⁹ *Id.*

¹¹⁰ See Ted Sichelman & Stuart J.H. Graham, *Patenting by Entrepreneurs: An Empirical Study*, 17 MICH. TELECOMM. & TECH. L. REV. 111, 115 (2010) (describing the study).

¹¹¹ See generally ERIC A. POSNER, *LAW AND SOCIAL NORMS* 18–27 (2000) (describing the value of credible signals).

¹¹² Long, *supra* note 108, at 646 (“R&D” stands for “research and development.”).

¹¹³ See, e.g., *Ecomagination*, GE, www.ge.com/about-us/ecomagination (last visited Sept. 13, 2013) (describing “ecomagination” as “GE’s commitment to build innovative solutions for today’s environmental challenges while driving economic growth”).

This informational asymmetry can be ameliorated by the patent system, in that investors can treat a corporation's "patent count" as a rough proxy for its R&D output.¹¹⁴ The Patent and Trademark Office, an independent and credible third party, determines what is patentable using consistent, long-established, rigorous standards.¹¹⁵ Any invention that is granted a patent is certified to be novel, useful, and non-obvious.¹¹⁶ Though those qualities do not necessarily or even probably translate into economic value, this stamp of approval may offer at least some risk-mitigating assurance to an investor.

This signal value of a patent appears to be borne out in practice. Commentators report that startup companies in particular use patents to try to "distinguish themselves as worthy of investment by venture capitalists."¹¹⁷ (This is not a new phenomenon. More than a century ago, Thomas Edison used his light bulb patent as collateral to finance a new company that would eventually become GE.¹¹⁸) Even if a given set of patents has "no intrinsic value for the company that owns them, they can provide an extrinsic value to outsiders estimating the company's worth."¹¹⁹ In this way, patents can be viewed as "currency" used to convince others that the firm is successful and worth investing in.¹²⁰ Similarly, many venture capitalists see patents as a way to quantify the productivity of their investments.¹²¹

¹¹⁴ Sichelman & Graham, *supra* note 110, at 113 ("[L]egal theorists have posited that patents can play an important role in 'signaling' the value of a firm's technology and inventiveness, both externally to the market and internally to managers."); Shubha Ghosh, *Patents and the Regulatory State: Rethinking the Patent Bargain Metaphor After Eldred*, 19 BERKELEY TECH. L.J. 1315, 1358 (2004) ("Like college degrees, patents are a signal of ability in a market where simple revelation of ability is not credible because everyone can make the same claim.").

¹¹⁵ See Ghosh, *supra* note 114, at 1358.

¹¹⁶ 2 MILGRIM, *supra* note 24, § 9.06; Ghosh, *supra* note 114, at 1363.

¹¹⁷ Ghosh, *supra* note 114, at 1358; see also Sichelman & Graham, *supra* note 110, at 157 ("Our respondents reported that financing and improving valuation upon exit—such as an acquisition or IPO—played a moderately to very important role in their decision to file for patents." (citation omitted)).

¹¹⁸ See ANDRE MILLARD, EDISON AND THE BUSINESS OF INNOVATION 43–46, 130 (Meritt Roe Smith ed., 1990).

¹¹⁹ Sichelman & Graham, *supra* note 110, at 123.

¹²⁰ Kimberly A. Moore, *Worthless Patents*, 20 BERKELEY TECH. L.J. 1521, 1523 (2005) (citing ADAM B. JAFFE & JOSH LERNER, INNOVATION AND ITS DISCONTENTS 16 (2004)); Daniel R. Foster, *Patents Become the New Currency Among Competing Tech Companies*, BLOOMBERG BNA MERGERS & ACQUISITIONS L. REP., Oct. 22, 2012; Kevin G. Rivette & David Kline, *Discovering New Value in Intellectual Property*, HARV. BUS. REV., Jan.–Feb. 2000, at 8, available at <http://www.pctcapital.com/pdfs/Harvard.pdf> ("Patents can help companies communicate their asset picture and earnings potential to investors and the financial community.").

¹²¹ Sichelman & Graham, *supra* note 110, at 123; Mark A. Lemley, *Reconceiving Patents in the Age of Venture Capital*, 4 J. SMALL & EMERGING BUS. L. 137, 143 (2000) ("[I]f you ask them how their companies are doing in the marketplace, they will answer you with reference to patents: 'Our company has patented this model'; 'our company got twelve

4. Alienability and Liquidity

Both patents and trade secrets may be sold, licensed, or otherwise alienated. Patent, however, has a clear advantage over trade secrecy in that a patent is much easier, cheaper and less risky to alienate than a trade secret.¹²² This also makes a patent a more liquid asset than a trade secret.

Compared to trade secrets, patents are a breeze to alienate. A patent is a government-granted property right to the invention disclosed in the patent. Having an official public document that delineates the invention precisely makes it relatively simple and inexpensive to alienate.

By contrast, a trade secret is much more challenging and expensive to alienate than a patent, for a number of reasons. Holders of trade secrets face a fundamental dilemma when they negotiate with potential buyers or licensees.¹²³ As one scholar has explained it, the “trade secret owner generally is reluctant to reveal the secret unless the potential licensee first promises not to use it in the event a license is not negotiated. The licensee, on the other hand, is not likely to make such a promise without first learning the secret.”¹²⁴ In other words, a trade secret owner needs to be extremely careful not to give away too much information to potential licensees or buyers so that she does not accidentally reveal the secret and thereby abandon her intellectual property right. But the potential licensee will not want to jump into a binding licensing agreement before getting a chance to fully assess the nature and value of the trade secret. All of this drives up the cost of negotiating trade secret licenses. By contrast, none of this is a problem in the patent context, as the relevant technology has already been disclosed to all parties in the patent.¹²⁵

To some extent, the parties can maneuver around this dilemma by drafting and signing non-disclosure agreements when negotiating for the alienation of trade secrets.¹²⁶ But these extra steps clearly add time, expense, and risk to the process of alienation.¹²⁷ And all the paperwork in the world cannot eliminate

patents this year”; “our company has patent applications that cover this, that, and the other thing.””).

¹²² Oren Bar-Gill & Gideon Parchomovsky, *Law and the Boundaries of Technology-Intensive Firms*, 157 U. PA. L. REV. 1649, 1678 (2009) (“Patent protection makes it much easier to transfer the protected information relative to trade secret protection.”).

¹²³ See Burk & McDonnell, *supra* note 83, at 584–85.

¹²⁴ Bone, *supra* note 10, at 280; see also Bar-Gill & Parchomovsky, *supra* note 122, at 1678 (“The secrecy requirement of trade secret protection thus detracts from the practical value of this form of legal protection by making it difficult to sell and license trade secrets to third parties. This problem is especially acute when the protected information needs to be disclosed in the precontractual stage of business negotiations.”).

¹²⁵ Burk & McDonnell, *supra* note 83, at 585.

¹²⁶ Bar-Gill & Parchomovsky, *supra* note 122, at 1678.

¹²⁷ *Id.* (“There are, of course, legal mechanisms designed to address this problem. Chief among those are NDAs [non-disclosure agreements] that oblige the discloser to refrain from disclosing confidential information. Powerful parties, however, often refuse to sign NDAs and instead demand that the disclosing party sign a legal document that releases the powerful

the risk that the trade secret will somehow be discovered through the course of negotiations, especially with multiple parties.

Furthermore, the right that is transferred in a patent is more clearly defined than in a trade secret, making it easier to value and, thus, less costly to alienate. A patent clearly describes the relevant invention in a government-approved document; there is no formal specification for a trade secret. A patent will last exactly twenty years; the lifespan of a trade secret is indeterminate. The upshot is that there is likely to be a higher degree of uncertainty and more disagreement about the value of a trade secret compared with a patent. And when two sides are very far apart on the value of the thing being bought and sold, the negotiations are likely to be protracted and expensive, and may even fail entirely.¹²⁸ Hence, for this reason too, patents are cheaper and easier to alienate than trade secrets.

Finally, because patents are less costly to alienate than trade secrets, they are also more liquid. Liquidity is generally seen as a valuable feature of an asset, because the world is unpredictable, and one may need (or want) to “cash out” of an investment on short notice. The enhanced liquidity of patents, then, amounts to an advantage for patent over trade secret.

One way in which we can see the liquid nature of patents compared to trade secrets is that several organized marketplaces to buy and sell patents have established themselves in recent years, such as Ocean Tomo and RPX,¹²⁹ but no comparable trade secret marketplaces appear to have developed.

In short, trade secrets are risky, costly and complicated to sell, license or otherwise alienate, rendering them rather illiquid assets. Patents, in contrast, are much easier, cheaper and safer to alienate, and are more liquid as well. Patents hold an advantage over trade secret, then, for those that may wish to alienate their IP.

5. *Cost*

The conventional analysis teaches that cost is a key concern when it comes to choosing between patent and trade secret protection.¹³⁰ This includes both the

party from all liability if the information is somehow disclosed. Even when an NDA is signed, its enforcement involves major evidentiary problems, owing in part to the complexity of defining the information and separating it from preexisting knowledge.”).

¹²⁸ See, e.g., MARK PENDERGRAST, *FOR GOD, COUNTRY AND COCA-COLA* 36–49 (1993) (recounting “the tangled chain of title” to the secret formula for Coca-Cola).

¹²⁹ See RPX CORP., <http://www.rpxcorp.com/rpx-services> (last visited Sept. 13, 2013) (“Through our core Defensive Patent Acquisition services—open market buying and litigation purchases—and through large-scale structured transactions, we acquire high-risk patents and patent rights.”); OCEAN TOMO, <http://www.oceantomo.com/home> (last visited Sept. 13, 2013).

¹³⁰ LANDES & POSNER, *supra* note 77, at 357–60.

cost of obtaining IP protection, and the cost of maintaining that protection, including through litigation.¹³¹

Obtaining a patent is a lengthy and expensive process that entails drafting a technical and specialized document and responding to challenges or rejections by the Patent Office. Filing fees, attorneys' fees, and other costs of patenting an invention amount to tens of thousands of dollars, and the process takes about four years, on average.¹³² In addition, since a U.S. patent only protects against domestic infringement, a multinational corporation requiring global protection would have its financial and administrative application costs multiplied by the number of countries in which it sought patents.¹³³

Trade secret protection, in sharp contrast, is instant and free to acquire, as there are no documents to draft and no government office to convince.¹³⁴ The cost of obtaining trade secret protection is zero. And as for international protection, the particulars of trade secret law might vary from nation to nation (just as it does from state to state in the U.S.), but because there is no need to file for trade secret protection, there would be no additional procedures or expenses, either.¹³⁵

When it comes to maintenance and litigation costs, however, the question is much closer. It costs several thousand dollars in periodic maintenance fees to keep a patent current. Beyond that, valuable patents are commonly the subject of litigation, the cost of which can easily reach several million dollars.¹³⁶ So the cost of maintaining a patent through its twenty-year term is often quite high. This can be seen by the common phenomenon of a patent holder letting her patent lapse after only five or ten years because it is not worth the periodic maintenance fees the Patent Office demands.¹³⁷

The costs of maintaining and litigating a trade secret, however, can likewise be significant. This is primarily because the law will only come to the aid of the secret-holder if she invests in "reasonable precautions" to guard the secret.¹³⁸ The cost of doing so could be low or high, depending on the sort of measures

¹³¹ The comparative costs of alienation are relevant here, but were addressed in the previous sub-section.

¹³² Anderson, *supra* note 37, at 925, 957; Lemley, *Surprising*, *supra* note 10, at 331; Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1498–99 (2001) [hereinafter Lemley, *Rational*].

¹³³ The Patent Cooperation Treaty and TRIPS may reduce this cost. See *supra* note 11.

¹³⁴ Moore v. Regents of Univ. of Cal., 793 P.2d 479, 514 (Cal. 1990); POOLEY, *supra* note 37, § 3.01(5); Anderson, *supra* note 37, at 925.

¹³⁵ POOLEY, *supra* note 37, § 3.01(1)(a).

¹³⁶ SNYDER & ALMELING, *supra* note 28, at 19 (reporting that high-stakes patent litigation with \$25 million or more at stake costs an average of \$5.5 million, per side) (citing AM. INTELL. PROP. L. ASS'N, REPORT OF ECON. SURVEY 29 (2009)).

¹³⁷ Lemley, *Rational*, *supra* note 132, at 1503.

¹³⁸ See *supra* text accompanying notes 24–26.

that the owner is obliged to take.¹³⁹ Expenditures like adding locks or drafting employee non-disclosure agreements might be relatively modest, while building a super-secure facility or implementing a cyber-security program might ultimately cost more than patenting.¹⁴⁰ And litigation over trade secrets can be expensive, but is generally significantly less costly than patent litigation.¹⁴¹

In sum, trade secret usually holds the edge on the question of cost, though it is a highly fact-intensive inquiry depending on many factors.

* * *

The conventional framework for deciding between patent and trade secret protection calls for a subtle and nuanced analysis between the two forms of IP. This conventional analysis completely omits one factor, however, the nature of the person making the choice.

The next Part seeks to partially address that omission and explain why a corporation should have a thumb on the scale in favor of trade secrecy.¹⁴²

III. THE CORPORATE PREFERENCE FOR TRADE SECRET OVER PATENT

The conventional analysis of the choice between patent and trade secret explored in the last Part includes a number of key considerations. It ignores, however, one important factor: Who—or what—is making the choice? This Part takes up one part of that question and makes the novel claim that the corporate form should lead to a systematic preference for trade secret over patent for corporate inventions.¹⁴³

Corporations are creatures of statute, legal entities defined by their legal attributes, including limited liability, centralized management, perpetual life, capital lock-in, and alienable shares.¹⁴⁴ This Part will show that each of these legal characteristics should play a material role in the patent/trade secret decision, and tip the scales toward trade secret. The argument has four components, each premised on a different aspect of the legal form of the corporation.

¹³⁹ Friedman et al., *supra* note 10, at 63. Compare Anderson, *supra* note 37, at 958 (asserting that security measures can cost far more than patent protection), with POOLEY, *supra* note 37, § 3.01(5)(b) (“[T]he cost of security measures . . . is usually modest.”).

¹⁴⁰ The vault that holds the formula for Coca-Cola reportedly includes a hand-imprint scanner. *Coca-Cola Moves Super-Secret Formula*, EXAMINER.COM (Dec. 9, 2011), <http://www.examiner.com/article/coca-cola-moves-super-secret-formula>.

¹⁴¹ See *supra* note 136.

¹⁴² This Article uses the term “corporation” to refer to a for-profit business corporation unless otherwise noted.

¹⁴³ Much of this discussion would apply equally to other legal forms of business organization, such as a Limited Liability Company (LLC).

¹⁴⁴ See generally Schwartz, *Perpetual*, *supra* note 7, at 768.

First, corporations are endowed with perpetual existence, as this author has focused on in prior work.¹⁴⁵ This means that they are especially well positioned to reach for the perpetual returns that a trade secret may provide. Corporations should therefore prefer the uncertain but potentially infinite term of a trade secret to the fixed twenty-year term of a patent.¹⁴⁶

Second, as Margaret Blair and Lynn Stout have explored, shareholders' capital is "locked in" to a corporation, as are any profits generated by the business.¹⁴⁷ Dividends, buybacks, or other distributions to shareholders are in the discretion of management. Thanks to this "lock in" effect, corporations have relatively less need to raise outside capital, especially compared with venture capital or private equity funds, which must by design regularly seek fresh funding. The upshot is that corporations should have relatively low appreciation for the "signal" value of a patent (which is valuable for attracting financing) and, as such, should tend toward trade secret.

Third, because corporations offer limited liability and centralized management, they are well positioned to practice an invention "in-house," thus avoiding the relatively high transaction costs of alienating a trade secret. This undermines a major attraction of a patent, which is the low transaction costs of alienation, again implying a corporate preference for trade secret.

Fourth, shares of stock in a corporation may generally be bought or sold on the open market. This means that they can act as tradable units tied to a trade secret maintained by the corporation. The effect is that trade secrets can be made nearly as liquid as patents, again undermining a perceived advantage of patent and pointing corporations toward trade secret.

In short, this Part will claim that there exists an inherent corporate preference for trade secret, that the preference arises from the legal nature of the corporate form, and that the preference plays a previously unrecognized and material role in the patent/trade secret decision for corporate inventions. This Article uses "material" as it is used in the securities law context, which is to say important in the overall analysis, though not necessarily dispositive.¹⁴⁸

The Article does not claim that every corporation should always select trade secrecy for every invention. Surely there are many instances where patent is the obvious choice, for conventional reasons, as in the case of a Rubik's Cube. But those cases aside, the choice between patent and trade secret is often a close call, and a little nudge one way or the other could make the difference. This Part asserts that, in those close cases, corporations should place a thumb on the scale in favor of trade secrecy due to their formal legal characteristics.¹⁴⁹

¹⁴⁵ See *id.* at 773–77.

¹⁴⁶ Non-corporate entities and natural persons, thanks to their limited lives, would have the opposite preference, i.e., for the fixed term of patent.

¹⁴⁷ See *infra* Part IV.

¹⁴⁸ See *Basic, Inc. v. Levinson*, 485 U.S. 224, 231–32 (1988); *supra* note 5.

¹⁴⁹ To be clear, this Article is not asserting that all corporate inventions should be protected as trade secrets. Rather, it is merely claiming that when a corporation is called upon to decide whether to protect a corporate invention using trade secrecy or patent, one

A. The Corporate Form Yields a Preference for Trade Secret

1. Corporations and Trade Secrets Share a Perpetual Nature

A trade secret is not limited to a term of years; rather it has a perpetual duration.¹⁵⁰ The same can be said for a corporation: A defining attribute of the corporate form is that it is endowed with perpetual existence,¹⁵¹ as this author has discussed in previous work.¹⁵² For example, the Delaware General Corporate Law provides that “the corporation shall have perpetual existence” and the New York Business Corporation Law grants to every corporation the “power . . . to have perpetual duration.”¹⁵³

Corporations and trade secrets are both “perpetual” in similar ways: they both have the potential to be truly immortal and eternal, but in practice they are highly fragile and might cease to exist on any given day. As we have seen, a trade secret that is never reverse engineered or independently invented could theoretically last forever.¹⁵⁴

However, many (if not most or nearly all) inventions will eventually be independently invented sooner or later.¹⁵⁵ And as for a corporation, it is potentially immortal, except that its existence can be terminated in a number of ways, including bankruptcy, dissolution, and merger¹⁵⁶—all of which happen regularly in practice.¹⁵⁷ But the key point is that, although they are fragile and certainly not assured of eternal existence, corporations and trade secrets both have the capacity to persist forever.¹⁵⁸

material factor that should be considered—in addition to all of those discussed in Part I—is the inherent corporate preference for trade secrecy.

¹⁵⁰ See *supra* Part I.A.

¹⁵¹ *Trs. of Dartmouth Coll. v. Woodward*, 17 U.S. (4 Wheat.) 518, 636 (1819) (Marshall, C.J.) (observing that the corporate form allows “a perpetual succession of individuals” to act “for the promotion of the particular object, like one immortal being”); BLACKSTONE’S COMMENTARIES ABRIDGED 383 (Gaunt, Inc. ed., 2001) (1855) (describing the corporation as “a person that never dies”; its shareholders and managers may change, but it is still the same corporation, just “as the river Thames is still the same river, though the parts which compose it are changing every instant”).

¹⁵² See Schwartz, *Perpetual*, *supra* note 7, at 773–77.

¹⁵³ N.Y. BUS. CORP. LAW § 202(a)(1) (McKinney 2003). Perpetuity is the default rule. See, e.g., DEL. CODE ANN. tit. 8, § 102(b)(5) (2011). Incorporators are generally permitted to provide for a term of years, rather than perpetual duration, in the certificate of incorporation, e.g., *id.*, but they almost always take the default rule of perpetual duration. Schwartz, *Perpetual*, *supra* note 7, at 774.

¹⁵⁴ See *supra* Part II.B. But cf. LANDES & POSNER, *supra* note 77, at 311 (calculating the “average economic life for a patent” to be 16.6 years).

¹⁵⁵ *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 491 (1974).

¹⁵⁶ Schwartz, *Perpetual*, *supra* note 7, at 807.

¹⁵⁷ *Id.*

¹⁵⁸ *Id.*

This connection between corporate form and trade secret law has not been recognized until now,¹⁵⁹ but the consequence seems clear: corporations should tend to prefer trade secret protection over patent because they are perpetual entities that are perfectly suited to enjoy the potentially perpetual income stream that only trade secret can offer.¹⁶⁰

Being perpetual, a corporation should rationally employ an investment strategy akin to that of a hypothetical “immortal investor.”¹⁶¹ This allows the corporation to make business decisions without fear that it might perish before receiving the fruits of its labor. In technical terms, this means that a perpetual corporation can invest with a longer time horizon and lower discount rate than a natural person ever would.¹⁶²

With regard to time horizon, a person’s investment time horizon must depend in part on one’s life expectancy.¹⁶³ Thus, natural persons invest with a time horizon of months, years, or decades. An immortal investor, in contrast, can invest with time horizons even longer than that. As for “inherent discount rate,” this is the amount by which a person discounts delayed rewards compared to present ones, and it depends on one’s likelihood of surviving to the payoff.¹⁶⁴ By the nature of things, an immortal investor can and should employ a lower inherent discount rate than a rational mortal would use. These two differences in investment strategy yield important investing advantages for immortal investors, including that it allows them to invest in illiquid and/or volatile assets.¹⁶⁵

The application to the patent/trade secret decision is straightforward, if novel. When a corporation must decide between patent and trade secrecy, its perpetual nature should cause it to systematically prefer secrecy. The potential for a legal monopoly on a patent-eligible invention that continues for many decades—or even a century or more—is too attractive to pass up for a corporation that can and should plan for perpetual profitability.

This is not idle speculation. In one trade secret case that reached the United States Supreme Court, for instance, the corporate plaintiff told the lower court that it had elected trade secrecy precisely in order to “extend the commercial monopoly of the invention beyond the 17 years granted by the Patent Laws.”¹⁶⁶

¹⁵⁹ The published record appears bereft of any discussion of the connection between the potentially perpetual nature of both corporations and trade secrets. E-mail from Jane Thompson, Assistant Dir. for Faculty Servs., Univ. of Colo. William A. Wise Law Library, to Andrew A. Schwartz, Assoc. Professor of Law, Univ. of Colo. Law Sch. (June 27, 2012, 17:43 MT) (on file with author).

¹⁶⁰ See Schwartz, *Perpetual*, *supra* note 7, at 773–77.

¹⁶¹ See *id.* at 805–12.

¹⁶² *Id.* at 783.

¹⁶³ *Id.*

¹⁶⁴ *Id.*

¹⁶⁵ *Id.*

¹⁶⁶ *Kewanee Oil Co. v. Bicron Corp.*, 478 F.2d 1074, 1078 (6th Cir. 1973), *rev’d on other grounds*, 416 U.S. 470 (1974).

And in a recent case before the Kansas Supreme Court, the inventor testified that he formed a corporation and elected trade secrecy specifically to obtain protection that would endure for longer than the limited term offered by a patent.¹⁶⁷

Skeptics might argue that “the extension of protection beyond the twenty-year patent term” that secrecy provides “is unlikely to have significant incentive effects, because of discounting to present value.”¹⁶⁸ This may be true when dealing with relatively high inherent discount rates, but as this author has discussed in prior work, perpetual corporations may display very low discount rates,¹⁶⁹ so low in fact that the extra years really do make a difference. Just try telling Coca-Cola or its shareholders that twenty years of monopoly would have provided them with all the profits they could ever want!

When the formula for Coca-Cola was invented by an Atlanta chemist in the late nineteenth century, it could almost certainly have been patented, as it was believed at the time to have medicinal properties.¹⁷⁰ So patent protection was available, but the founders and early managers of the Coca-Cola Co. declined to apply for one.¹⁷¹ Rather, they elected to protect the formula as a trade secret.¹⁷² The production facility was locked behind a sheet-iron safe door, and the mixing of the ingredients was only done by one or two senior executives.¹⁷³ And thanks to continuous, careful security over the years, the formula remains a profitable secret today, more than 100 years after its development.¹⁷⁴

¹⁶⁷ *Progressive Prods., Inc. v. Swartz*, 258 P.3d 969, 973 (Kan. 2011); *Progressive Prods., Inc. v. Swartz*, 205 P.3d 766, 770 (Kan. Ct. App. 2009) (“According to Allison, he did not seek a patent because doing so would publicize the ingredients to Ceram-Back and because a patent would last only for 17 years.”).

¹⁶⁸ LANDES & POSNER, *supra* note 77, at 359–60.

¹⁶⁹ See Schwartz, *Perpetual*, *supra* note 7, at 786–91, 805.

¹⁷⁰ CONSTANCE L. HAYS, *THE REAL THING: TRUTH AND POWER AT THE COCA-COLA COMPANY* 101 (2004) (in the early years, the company “insisted that Coca-Cola had medicinal properties”); FREDERICK ALLEN, *SECRET FORMULA: HOW BRILLIANT MARKETING AND RELENTLESS SALESMANSHIP MADE COCA-COLA THE BEST-KNOWN PRODUCT IN THE WORLD* 42 (1994) (early marketing materials claimed that Coca-Cola “cured headaches, calmed the nerves, strengthened the muscles and provided ‘mental clearness’”); Lemley, *Surprising*, *supra* note 10, at 341 (“[T]he inventors of Coca-Cola could have chosen to patent it but didn’t.”).

¹⁷¹ Manuel Schiffres & Gail Bronson, *Businesses Struggle To Keep Their Secrets*, U.S. NEWS & WORLD REP., Sept. 23, 1985, at 59 (“To avoid any disclosure at all, Coca-Cola never sought a patent . . .”).

¹⁷² HAYS, *supra* note 170, at 18 (“From the beginning, secrecy was the cornerstone upon which all things Coca-Cola revolved.”). The Coca-Cola Co. was incorporated in Georgia on January 29, 1892. PENDERGRAST, *supra* note 128, at 61.

¹⁷³ HAYS, *supra* note 170, at 18; see also ALLEN, *supra* note 170, at 36; PENDERGRAST, *supra* note 128, at 60 (describing the “elaborate ritual” of removing the labels from ingredients and replacing them with numbers).

¹⁷⁴ HAYS, *supra* note 170, at 110 (“The formula [lies] locked in bank vault . . . No one at the company, except two or three people at a time, kn[ows] the precise formula. E]verything [is] a secret.”); Schiffres & Bronson, *supra* note 171, at 59 (reporting that

And Coke is not a lone example. There are many examples of corporate inventions that have been maintained as trade secrets for decades or even centuries. Consider the drum cymbal. In 1623, Avedis Zildjian, an alchemist living in Constantinople, invented an alloy of copper, tin, and silver that produced a uniquely fine sound. The formula has been kept a family secret ever since then, passed from father to son for centuries.¹⁷⁵ In 1929, the secret was vested in a Massachusetts corporation, where it remains.¹⁷⁶ The corporation today controls about 60% of the world market share in cymbals, and continues to reap monopoly profits.¹⁷⁷

A more contemporary example of this phenomenon is the algorithm behind Google's dominating search engine. The algorithm, known as "PageRank," is carefully maintained as a trade secret by Google.¹⁷⁸ Google owes much of its success to PageRank.¹⁷⁹ The company has invested in many business lines apart from Internet search, but that remains the driving force behind its profitability.¹⁸⁰ Had the algorithm been patented when it was developed (in 1998), the end of the twenty-year term would already be on the horizon. As it stands, however, Google has a potentially perpetual monopoly over its "secret sauce," and it can continue to profit from it for many years to come.¹⁸¹

Google is not unique in this regard. eHarmony is another Internet corporation that has derived enormous value from the use of a closely guarded secret algorithm. The creators of the online dating website reportedly spent three years researching "the key dimensions of that predicted compatibility and the potential for long-term relationship success" before launching the website in

"Coca-Cola's mania for secrecy assumed a new sense of urgency when the company's lawyers told a federal judge . . . that it would defy his order to give the court the ingredients for Coke").

¹⁷⁵ Klein, *supra* note 84, at 438 n.7 (citations omitted).

¹⁷⁶ See *id.*; see also *About Zildjian*, ZILDJIAN, <http://zildjian.com/about/history/background> (last visited Oct. 10, 2013).

¹⁷⁷ David M. Herszenhorn, *In a Family Business, the Beat Goes On*, N.Y. TIMES, Mar. 31, 1996, at F11.

¹⁷⁸ SNYDER & ALMELING, *supra* note 28, at 9–10; VAN LINDBERG, *INTELLECTUAL PROPERTY AND OPEN SOURCE: A PRACTICAL GUIDE TO PROTECTING CODE* 130 (2008) ("Nobody outside of Google knows the exact details of its search algorithms and, despite the best efforts of the search engine optimization crowd, nobody has been able to fully figure them out."). It bears noting that certain technologies related to PageRank have been patented, see, e.g., U.S. Patent No. 7,269,587 (filed Dec. 1, 2004); U.S. Patent No. 6,285,999 (filed Jan. 9, 1998), but the "crown jewel" algorithm has always been a trade secret.

¹⁷⁹ See generally Kurt Bryan & Tanya Leise, *The \$25,000,000 Eigenvector: The Linear Algebra Behind Google*, 48 SIAM REV. 569 (2011).

¹⁸⁰ Kevin Smith, *PRESENTING: The 10 Best Google Products Ever*, BUSINESS INSIDER (June 27, 2012, 11:36 AM), <http://www.businessinsider.com/the-10-best-google-products-2012-6?op=1>.

¹⁸¹ See James Temple, *Europeans Open Probe of Google*, S.F. CHRON., Dec. 1, 2010, at A1 (referring to "the 'secret sauce' of [Google's] search algorithm"); Steven Levy, *All Eyes on Google*, NEWSWEEK, Mar. 29, 2004, at 50 (referring to Google's "secret-sauce search techniques").

2000.¹⁸² By 2010, the dating service was reporting an annual revenue of \$200 million¹⁸³ and claimed that its matchmaking services were responsible for an average of 542 marriages each day.¹⁸⁴ If it had sought patent protection for its golden compatibility formula, the company would already have burned ten years of the twenty-year patent term. Instead, the corporation elected trade secrecy, and may continue to exercise dominion over the algorithm for decades to come.

This evidence is merely anecdotal, but it is consistent with the theory that perpetual corporations should show an affinity for perpetual trade secrets.

2. Capital Lock-In Means Corporations Have Less Need To Signal

As discussed in Part II.B.3 above, a patent can act as a strong positive “signal” for the patent-holding firm by demonstrating to potential investors that the firm is well-managed and potentially worth investing in. This signal value is an important advantage that patent holds over trade secret, according to the conventional analysis.¹⁸⁵

The signal value of a patent is clearly worth more to a party with a significant need to raise fresh capital, and worth less to a party with little or no need to raise fresh capital.¹⁸⁶ Corporations, as a class, fall generally into the latter group, thanks to the legal feature known as “capital lock-in.”

As Margaret Blair and Lynn Stout have explained, the initial capital contributed by stockholders to a corporation becomes “locked in” to the corporation and cannot be withdrawn.¹⁸⁷ The corporation may issue dividends, buy back stock, or otherwise send cash back to shareholders, but these are all discretionary choices to be made by the board of directors.¹⁸⁸ The shareholders have no power to demand their money back once it has been paid into the

¹⁸² *Company Overview*, EHARMONY, <http://www.eharmony.com/about/eharmony/> (last visited June 28, 2012).

¹⁸³ Tanzina Vega, *Dating Site Marks 10 Years with Ad Campaign*, N.Y. TIMES, Aug. 15, 2010, at B4, available at <http://www.nytimes.com/2010/08/16/business/media/16eharmony.html>.

¹⁸⁴ *Study: 542 People Married Every Day in U.S., on Average, Through eHarmony*, EHARMONY (Aug. 16, 2010), <http://www.eharmony.com/press-release/31>.

¹⁸⁵ See *supra* Part II.B.3.

¹⁸⁶ See *supra* Part II.B.3.

¹⁸⁷ See generally Schwartz, *Perpetual*, *supra* note 7, at 776.

¹⁸⁸ DEL. CODE ANN. tit. 8, § 141(a) (2011).

corporation.¹⁸⁹ The primary positive effect of capital lock-in is that it enhances the corporation's ability "to invest in long-lived, highly specific assets."¹⁹⁰

But lock-in also has its dark side, as it gives rise to the possibility that corporate managers will use the locked-in capital to benefit themselves rather than the corporation or its shareholders.¹⁹¹ To address this potential for opportunism, non-corporate forms of business organization, such as limited partnerships, have been developed that require the entity to be liquidated after a set number of years, thus minimizing the lock-in effect.¹⁹²

For instance, private equity funds are commonly organized as limited partnerships with a fixed term of ten years, at which point the managers are contractually obliged to liquidate the fund and distribute returns.¹⁹³ The theory is that the management team will be disciplined by the knowledge that they will have to return to the capital markets (for their next fund) within a few years, rather than having "free rein to invest earnings in new projects."¹⁹⁴

The signal effect of a patent is extremely valuable to non-corporate business entities that lack capital lock-in, for they (or their managers) are obliged to periodically seek funding from outsiders to remain in business. Recall that a patent signals to outsiders that the patent-holder is competently managed and has an effective R&D program, thus attracting potential investors and lowering the cost of capital. For those that need to raise capital on a regular basis, such a signal is essential to survival.¹⁹⁵

Corporations, by contrast, have locked-in capital, which enables management to grow and develop the business using internally generated profits, thus decreasing the need to solicit financing.¹⁹⁶ In fact, it turns out that most corporate projects are financed through internally generated cash flows.¹⁹⁷

¹⁸⁹ Lynn A. Stout, *On the Nature of Corporations*, 2005 U. ILL. L. REV. 253, 255–56 ("A corporation's assets belong to the corporation, and not to its equity investors. As a result, those assets cannot be unilaterally withdrawn from the firm by either its shareholders, or the creditors of its shareholders. . . . Like a tar pit, a corporation is much easier for an equity investor to get into, than to get out of.").

¹⁹⁰ Margaret M. Blair, *Reforming Corporate Governance* 6 (Georgetown Univ. Law Ctr. Bus. Econ. & Regulatory Policy Working Paper No. 485663, 2003).

¹⁹¹ See LARRY RIBSTEIN, *THE RISE OF THE UNCORPORATION* 209 (2010).

¹⁹² *Id.* at 212.

¹⁹³ See *id.* at 222–26.

¹⁹⁴ *Id.* at 224; Mohsen Manesh, *Contractual Freedom Under Delaware Alternative Entity Law: Evidence from Publicly Traded LPs and LLCs*, 37 J. CORP. L. 555, 565 (2012) (summarizing Ribstein's analysis).

¹⁹⁵ See *supra* Part II.B.3.

¹⁹⁶ See, e.g., Andy Kessler, *Travis Kalanick: The Transportation Trustbuster*, WALL ST. J., Jan. 26, 2013, at A13 (describing fledgling car-service company that sold 10% of its stock for \$37 million, then expanded greatly over several years, "all without raising any more money").

¹⁹⁷ A.C. Pritchard, *Markets as Monitors: A Proposal To Replace Class Actions with Exchanges as Securities Fraud Enforcers*, 85 VA. L. REV. 925, 945 (1999); see also Lynn A. Stout, *The Unimportance of Being Efficient: An Economic Analysis of Stock Market Pricing*

The reduced need for a corporation to solicit financing from outsiders means that the signal value of a patent is relatively undervalued by a corporation, at least as compared with their non-corporate brethren.

This is not to say that corporations rarely seek fresh capital from outsiders. To the contrary, corporations commonly raise outside capital in practice, even sometimes when they are awash with cash.¹⁹⁸ But the point is that capital lock-in allows a corporation to operate indefinitely based on internally generated profits, thus lessening the need for outside capital.¹⁹⁹ And this undermines one reason to choose patent over trade secret, tipping the scales toward trade secret for corporate inventions.

In short, the relative undervaluation of the signal aspect of a patent, due to capital lock-in, constitutes another reason why corporations should have a relative preference for trade secret over patent.

3. The High Transaction Costs of Alienating a Trade Secret Can Be Avoided by Practicing In-House

It is cheaper and easier to alienate a patent than a trade secret. As discussed in Part II.B.4 above, the nature of the patent as a public document, with relatively clear metes and bounds, makes the transaction costs of alienation relatively low. In sharp contrast, the transaction costs of alienating a trade secret are high, especially if one includes the risk that the secret is somehow lost or publicized in the process of negotiating a deal. This all amounts to a significant advantage for patent over trade secret in the conventional analysis.²⁰⁰

But this advantage is muted if an invention is practiced "in-house" by its owner, as opposed to licensed, sold, or otherwise alienated.²⁰¹ And corporations, thanks to two aspects of their legal form, namely centralized management and limited liability, are especially well positioned to put their corporate inventions into practice themselves.

"Limited liability" is the idea that shareholders of a corporation are generally not liable for the debts of the corporation, even if the corporation cannot afford to repay its debts and goes bankrupt, leaving unsatisfied creditors.²⁰² Thanks to this rule of limited liability, the most that a shareholder can lose is what she paid for her shares.²⁰³

and Securities Regulation, 87 MICH. L. REV. 613, 648 (1988) (observing the "predominance of internally generated cash" as a source for corporate funding).

¹⁹⁸ See, e.g., Patrick McGee, *Corporate Debt Sales Hit Record*, WALL ST. J., Dec. 11, 2012, at C4.

¹⁹⁹ See *supra* note 196 and accompanying text.

²⁰⁰ See *supra* Part II.B.4.

²⁰¹ Beckerman-Rodau, *supra* note 37, at 403 ("[I]f an enterprise will use its novel technology exclusively in-house," then "reliance on trade secret protection [rather than patent] may be a desirable option."). To "practice" an invention is to make use of it.

²⁰² See *Walkovsky v. Carlton*, 223 N.E.2d 7, 7 (N.Y. 1966).

²⁰³ See *id.* at 7-8.

The conceptual reason for limited liability is that the debts are those of the corporation, not its shareholders. The policy rationale for this rule is that it allows corporations to aggregate capital from many individuals and invest on a large scale.²⁰⁴ In the absence of limited liability, shareholders would be deterred from investing, especially in risky projects, because they could be held personally liable for the full extent of the damage caused.

“Centralized management” refers to the idea that the management of a corporation is vested in a board of directors, defined as a small group of individuals, commonly five or ten.²⁰⁵ The directors are elected by the shareholders to manage the business and affairs of the corporation.²⁰⁶ Centralized management is a practical necessity in major corporations with thousands or millions of shareholders. It would not be possible for so many people to make business decisions collectively. The board of directors commonly delegates its decision making authority to executive officers, such as the CEO and CFO, for most issues.

These two core legal aspects of the corporate form, limited liability and centralized management, put corporations in a good position to practice corporate inventions themselves, rather than alienating them.

As for limited liability, practicing a brand new invention is a risky endeavor by its very nature. The effects of a new invention are by definition unknown. It may injure people or property, or cause environmental damage, for instance. To practice a corporate invention in-house means keeping all those risks with the corporation. But thanks to limited liability, the corporation is well designed to serve precisely that role. Indeed, shareholders are given limited liability so that the corporation may attempt risky, but potentially socially beneficial, business ventures, such as developing and practicing a new invention.

And as for centralized management, to actually practice a valuable invention can often be an expensive and complex undertaking. Centralized management responds well to these concerns by gathering vast amounts of capital (billions of dollars, say) to be managed by a small group of specialists.

The consequence is that corporations, thanks to their legal form, are excellent vehicles for internally developing and practicing new inventions.²⁰⁷ As such, there should be relatively less need or interest to a corporation to alienate a new invention, at least as compared with a natural person.²⁰⁸ This undercuts the alienability advantage of patent over trade secret, making trade secret protection relatively more attractive to corporations.

²⁰⁴ See generally RIBSTEIN, *supra* note 191.

²⁰⁵ See DEL. CODE. ANN. tit. 8, § 141(b) (2011).

²⁰⁶ See *id.* § 141(a)–(b).

²⁰⁷ FISK, *supra* note 24, at 177 (“Many large corporations established research and development facilities in the first decade of the twentieth century to systematize invention. Innovations became more likely to be made in a research lab or in some other collective setting by someone working as an employee of a corporation.”).

²⁰⁸ Most non-corporate entities, such as LLCs, possess limited liability and centralized management. See RIBSTEIN, *supra* note 191, at 153–56.

The chemical industry provides a good example of this corporate tendency to protect an invention as a trade secret and practice it in-house.²⁰⁹ Wyeth, for example, developed a method of producing Premarin, a hormone replacement therapy prescribed for the symptoms of menopause, known as the “Brandon Process” in 1942 and kept it as a trade secret for more than sixty years.²¹⁰

Similarly, E.I. Du Pont de Nemours & Co. (“DuPont”) developed Kevlar, the fiber used in bulletproof vests, and a method of producing it, in the 1960s. It patented the fiber itself years ago, but has maintained its production method as a trade secret for more than a half-century.²¹¹ And this is typical for DuPont, a major chemical company that has regularly been involved in litigation to protect the many trade secrets it has developed and practices in-house.²¹²

And Wyeth and DuPont are not outliers. To the contrary, survey results reveal that in-house utilization of trade secrets is a common focus among chemical corporations.²¹³ And the chemical industry has lobbied fiercely for stronger trade secret protection, such as harsher punishments for misappropriation, a unified federal statutory scheme, and a lesser burden of proof.²¹⁴ This evidence supports the idea that corporations are well positioned to practice secret inventions in-house and avoid the transaction costs of alienation.

4. Liquidity in a Trade Secret Can Be Achieved via Alienable Shares in the Corporation Holding It

Recall that one advantage of patent over trade secret is that a patent is much more liquid than a trade secret.²¹⁵ Indeed, patents have come to be seen by

²⁰⁹ See Munson, *supra* note 72, at 697–99. By contrast, mechanical or electrical innovations are often easy to reverse engineer, making patent protection the only realistic route for IP protection. *Id.* at 696.

²¹⁰ See *Wyeth v. Natural Biologics, Inc.*, 395 F.3d 897, 899 (8th Cir. 2005).

²¹¹ See *E.I. du Pont de Nemours & Co. v. Kolon Indus., Inc.*, No. 3:09 cv 58, 2011 WL 1597528 (E.D. Va. Apr. 27, 2011); 1965 Kevlar®, DUPONT.COM, www2.dupont.com/Phoenix_Heritage/en_US/1965_b_detail.html (last visited Sept. 8, 2013).

²¹² *E.g.*, *E.I. duPont deNemours & Co. v. Christopher*, 431 F.2d 1012 (5th Cir. 1970), *cert. denied*, 400 U.S. 1024 (1971); *Kolon*, 2011 WL 1597528. See generally FISK, *supra* note 24, at 196–97 (relaying that in the early 1900s, DuPont “started two research and development laboratories to systematize and centralize . . . research and innovation” within the corporation, and developed a corporate policy on trade secrets).

²¹³ Wesley M. Cohen et al., *Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (Or Not)* 6 (Nat’l Bureau of Econ. Research, Working Paper No. 7552, 2000), available at <http://www.nber.org/papers/w7552>; Richard C. Levin, et al., *Appropriating the Returns from Industrial Research and Development*, 1987 BROOKINGS PAPERS ON ECON. ACTIVITY 783, 793–98 (1987), available at <http://www.jstor.org/stable/2534454>.

²¹⁴ Munson, *supra* note 72, at 701.

²¹⁵ See *supra* Part II.B.4.

many as a sort of “currency”²¹⁶ that can be valued and liquidated for cash relatively easily, compared with a trade secret.²¹⁷ And because “liquidity is valuable, in and of itself,”²¹⁸ the question of liquidity is seen to point in favor of patent and against trade secret, at least in the conventional analysis.

But by using the corporate form, a trade secret can be made to be just as liquid as a patent. Shares of stock in a corporation are freely transferable and may generally be bought or sold at any time. The ease of these transactions attracts passive investors, who value the liquidity it provides. A shareholder with a need or desire to cash out (liquidate) her shares can sell her shares to a third party on the so-called “secondary market,” and walk away with cash.²¹⁹

Tradable shares in a corporation that owns a trade secret can make it just as easy to liquidate an interest in the trade secret as it would be to liquidate an interest in a patent. The upshot is that this neutralizes a perceived advantage of patent vis-à-vis trade secret, making the latter relatively more attractive for corporations.

Of course, this can become complicated if a corporation holds a number of trade secrets. In such a case, the shares of stock would represent interests in all of them, making it difficult, if not impossible, for a shareholder to liquidate her interest in a single trade secret. But such a conglomeration is not inevitable and it is certainly possible for a corporate entity to be so focused on a single trade secret that the shares can be seen as a rough proxy for the trade secret itself.

Coca-Cola provides a relatively good example of this in practice. The value of Coca-Cola Co. shares is based on its facilities, the value of its brand, and many other things. But because one important driver in the value of the company is the secret formula for Coke,²²⁰ the shares in the corporation act in some sense as a derivative for the value of the trade secret. The effect is that Coca-Cola shares function as the liquid equivalent of partial interest in the Coke formula.

B. Empirical Assessment

This Part has theorized an inherent corporate preference for trade secret over patent. Does this play out in practice? Do real-life corporations

²¹⁶ See Moore, *supra* note 120, at 1545–52; Foster, *supra* note 120.

²¹⁷ This is not to say that this process is easy in an absolute sense. See, e.g., Joseph Checkler, *Judge Approves Sale of Kodak Patents*, WALL ST. J., Jan. 11, 2013, <http://online.wsj.com/article/SB10001424127887324081704578235873073906146.html> (reporting that Eastman Kodak Co. sold its portfolio of digital-imaging patents to a collection of technology giants for \$527 million, well below “the \$2 billion or more Kodak originally sought at an attempted auction this past summer”).

²¹⁸ Andrew A. Schwartz, *Consumer Contract Exchanges and the Problem of Adhesion*, 28 YALE J. ON REG. 313, 321 (2011).

²¹⁹ Recall that a shareholder cannot force a corporation to return the capital she invested directly into the company, for it is “locked in.” See *supra* Part III.A.2.

²²⁰ See generally HAYS, *supra* note 170.

demonstrate such a preference? An authoritative answer to this question appears infeasible, because trade secrets are, by definition, secret. While it would be possible to assemble a list of corporate patents, it would clearly be impossible to obtain a comparable list of corporate trade secrets for purposes of a true empirical study.²²¹ For instance, DuPont holds thousands of patents as well as many trade secrets. While the number of patents it holds can be easily calculated, it is impossible to say how many trade secrets it holds, or whether any of those trade secrets could have been patented.

Even so, there do exist a number of major studies and surveys focused on patenting rates or IP more generally whose findings are consistent with this Article's theory.²²² This Section briefly reviews some of this data.

One researcher compiled patenting rates for over 8,000 innovations that were displayed at world fairs over the course of sixty-five years.²²³ She found that at the World's Fair in 1851, 89% of inventions were not patented, suggesting that inventors overwhelmingly preferred trade secrecy and its unlimited duration. Only as reverse engineering techniques became more efficient—and secrecy became correspondingly less practical—did rates of patenting rise.²²⁴

Another study found that biotechnology faculty with “industry support were four times as likely as other biotechnology faculty . . . to report that trade secrets had resulted from their university research.”²²⁵ This suggests that the industry collaborators felt that it was important to protect the value of new research with trade secrecy.

Additionally, “there is some evidence of a trend toward relying on trade secret protection” among corporations.²²⁶ One widely cited 1984 survey (“the Yale survey”) of how businesses select their IP protection method found that trade secrecy was “nearly as important” as patent for protecting products and

²²¹ See David S. Almeling et al., *A Statistical Analysis of Trade Secret Litigation in Federal Courts*, 45 GONZ. L. REV. 291, 293 (2009); Dreyfuss, *supra* note 37, at 737 n.216. Another problem is that trade secret law is almost entirely state law. Almeling et al., *supra*, at 296. Even when a case is heard in federal court, state law is almost invariably applied, pursuant to the *Erie* doctrine. See *Hanna v. Plumer*, 380 U.S. 460, 467 (1965); *Erie R.R. v. Tompkins*, 304 U.S. 64, 64 (1938). This absence of a nationally consistent cause of action means that “it is nearly impossible to isolate trade secret cases from other civil cases based on their data.” Almeling et al., *supra*, at 296.

²²² E.g., Cohen et al., *supra* note 213, at 2–3.

²²³ Petra Moser, *Innovation Without Patents—Evidence from World Fairs 2* (July 16, 2010) (unpublished manuscript) (on file with Stanford Univ. and Nat'l Bureau of Econ. Research), available at <http://www.ssrn.com/abstract=930241>; see also Anderson, *supra* note 37, at 954–55.

²²⁴ Moser, *supra* note 223, at 2; Anderson, *supra* note 37, at 955.

²²⁵ David Blumenthal et al., *University–Industry Research Relationships in Biotechnology: Implications for the University*, 232 SCI. 1361, 1364 (1986), available at <http://www.sciencemag.org/content/232/4756/1361.short>.

²²⁶ Dreyfuss, *supra* note 37, at 737 n.216.

“more effective” than patent in protecting processes.²²⁷ A decade later, the next major survey found “the importance of secrecy to have increased dramatically since the Yale survey.”²²⁸ And the most recent notable IP survey, the 2008 Berkeley Patent Survey, asked firms who chose not to seek patents why they chose to forego patent protection. About one third of respondents answered that they did not want to disclose valuable trade secrets, and “a nearly identical percentage of firms (36%) indicated that a reason not to file was the adequacy of trade secrecy.”²²⁹

None of this is conclusive. Yet the data that exists is at least consistent with the idea that corporations choose between patent and trade secret protection, and that, in making the choice, corporations have a preference for trade secret.

C. Historical Support

One final piece of support for this Article’s thesis is the history of the first patent statute, enacted in early Renaissance Italy. As will appear, the concept of a patent was created precisely because corporate-like entities, the craft guilds, employed trade secrecy so effectively. Like the empirical data just considered, this historical evidence is suggestive and consistent with the idea that corporations, thanks to their legal form, should prefer trade secrecy to patent protection.

²²⁷ Levin et al., *supra* note 213, at 795.

²²⁸ Cohen et al., *supra* note 213, at 3.

²²⁹ Sichelman & Graham, *supra* note 110, at 173. It appears that all, or the overwhelming majority of, respondents to two surveys were corporate entities. The data in the 1984 Yale Survey is almost exclusively from “publicly traded firms that reported R&D expenses in excess of either 1 percent of sales or \$35 million.” Levin et al., *supra* note 213, at 819. The Carnegie Mellon Survey selected firms with greater than \$5 million in sales in 1994. Cohen et al., *supra* note 213, at 5. It is highly likely that these were all or nearly all corporate respondents, because the LLC only came into existence in 1977, and was not adopted in Delaware (the forum of choice for large companies) until 1992, meaning that mature companies were never or rarely organized as LLCs or other non-corporate forms at that time. *See generally* RIBSTEIN, *supra* note 191, at 121, 125, 132; 68 Del. Laws 434, § 1 (1992) (adopting LLC enabling statute). Hence, one article reviewing the Yale and Carnegie Mellon surveys used the word “corporation” and “firm” interchangeably when describing the respondents. *See generally* Zvi Griliches, *Patent Statistics as Economic Indicators: A Survey*, in R&D AND PRODUCTIVITY: THE ECON. EVIDENCE 287–335 (Nat’l Bureau of Econ Research 1988), available at <http://www.nber.org/chapters/c8351>. The 2008 Berkeley survey stands on a different footing, as it surveyed “entrepreneurial companies,” which were defined as firms that had been founded from 1998–2008, some of which may well have taken forms other than corporate. Stuart J.H. Graham et al., *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 BERKELEY TECH. L.J. 1255, 1288–89 (2009) (contrasting its approach with previous studies, including Yale and Carnegie Mellon, which “tended to examine mainly large and publicly traded U.S. companies”).

Medieval craft guilds are often pointed to as the ancient forebears of the corporation.²³⁰ Certainly, the guilds had many of the same legal characteristics and performed many of the same functions as corporations. They owned and invested assets for the benefit of their members.²³¹ They organized supply and regulated manufacture.²³² And guilds, like corporations, were perpetual organizations that commonly endured well beyond the lifetimes of their founding members.²³³

This Article has argued that corporations have a special relationship with trade secrecy. And so it was with the guilds. They went to great lengths to maintain forever their technical knowledge as a secret known only within the guild.²³⁴ Furthermore, when the government began offering patents with limited terms in exchange for disclosure, the guilds generally declined the opportunity and stuck with secrecy.

Guilds existed for industries including silk, wool, printing, soap-making, mirror-making, dyeing, and myriad other crafts.²³⁵ The organizations provided the perfect environment for creativity to flourish and technical knowledge to develop. And once they created a new technology, they carefully guarded it and refused to let non-members in on the secret. Indeed, the guilds of the middle ages became “famed for guarding inviolably their trade secrets.”²³⁶ So long as competitors could not discover the guild’s secret information, the advantage remained. Thus, secrecy was a way for these proto-corporations to maintain a monopoly over their technical knowledge.

The leading example of this culture of concealment is the Murano glassmakers of Venice. Because of a combination of access to Syrian soda ash (which produces clearer glass) and an apparent tradition of experimentation with the materials and techniques of glass working, by the early thirteenth century Venetian glass products were coveted internationally for their superior quality.²³⁷ As “the fame of Venetian glassware increased, the specialized knowledge of Venetian glassmakers acquired ever greater value.”²³⁸

²³⁰ In fact, the French use the term “corporation” for both corporation and guild. *Corporation*, WORDREFERENCE.COM, <http://wordreference.com/entr/corporation> (last visited Sept. 9, 2013).

²³¹ RICHARD MACKENNEY, *TRADESMEN AND TRADERS: THE WORLD OF THE GUILDS IN VENICE AND EUROPE, C. 1250–1650*, at 1, 6 (1987).

²³² *Id.* at 1.

²³³ See Joanna Kostylo, *From Gunpowder to Print: The Common Origins of Copyright and Patent*, in *PRIVILEGE AND PROPERTY: ESSAYS ON THE HISTORY OF COPYRIGHT* 21, 39 (Ronan Deazley et al. eds., 2010).

²³⁴ FISK, *supra* note 24, at 27.

²³⁵ See generally MACKENNEY, *supra* note 231.

²³⁶ W. Hastings Swenarton, *Patents, Trade Secrets and Trade Names as Factors in Industrial Development*, 19 YALE L.J. 115, 118 (1909).

²³⁷ See PAMELA O. LONG, *OPENNESS, SECRECY, AUTHORSHIP: TECHNICAL ARTS AND THE CULTURE OF KNOWLEDGE FROM ANTIQUITY TO THE RENAISSANCE* 90 (2001).

²³⁸ *Id.*

In order to protect that value, the first glassblowers' guild was formed in 1224.²³⁹ Only guild members were allowed to practice the glassmaking trade in Venice, and they had to take a vow of secrecy and accept limits on their mobility. In order to "block the spread of technical knowledge and so forestall competition,"²⁴⁰ guild members were highly discouraged from emigrating or even traveling. Glassmakers faced ever-increasing punishments for leaving the Venetian Republic, ranging from fines to being stripped of guild membership.²⁴¹ In 1290, the entire glassmaking guild moved to an island near Venice, called Murano, in order to preserve the secret techniques.²⁴² Isolated there, the glassmakers "were, for many decades, forbidden to leave the island under penalty of death."²⁴³

In 1447, Venice passed the first general patent law in the history of the world, granting a term of ten years of exclusive use for registered patents.²⁴⁴ The patent statute, by promising profits and protection, was specifically designed to tempt the guilds—especially the Murano glassmakers—to reveal their secrets to the world.²⁴⁵

Despite this new incentive to divulge craft secrets in order to capitalize on the ten-year patent term, the Murano glassmakers did not take the bait and continued to operate, century after century, without ever publicly registering their processes and recipes. Even today, Murano glassmakers maintain that there is a competitive advantage to be gained from exclusive secret craft knowledge: when a master Murano glassmaker recently chose to share his secret techniques in workshops and demonstrations around the world, his island peers responded by ostracizing him.²⁴⁶ They apparently found his disclosure of the millennium-old secrets to be inexcusably shortsighted.

In sum, this section recounted the story of the Murano glassmakers guild to demonstrate the historical importance of trade secret for corporations.

²³⁹ *Venetian Glass*, ENCYCLOPÆDIA BRITANNICA, <http://www.britannica.com/EBchecked/topic/625141/Venetian-glass> (last visited Oct. 10, 2013).

²⁴⁰ Carlo Marco Belfanti, *Guilds, Patents, and the Circulation of Technical Knowledge: Northern Italy During the Early Modern Age*, 45 *TECH & CULTURE* 569, 574 (2004).

²⁴¹ LONG, *supra* note 237, at 90–91.

²⁴² Carolyn Battista, *Glitter and Gleam: A Show of Glass in New London*, N.Y. TIMES, Oct. 1, 1989, at C29, available at <http://www.nytimes.com/1989/10/01/nyregion/glitter-and-gleam-a-show-of-glass-in-new-london.html?pagewanted=all&src=pm>.

²⁴³ *Id.*

²⁴⁴ LONG, *supra* note 237, at 94–95 (the patent system was not an entirely novel idea, but rather a codification of a system of ad hoc granting of privileges that had previously existed).

²⁴⁵ *Id.*

²⁴⁶ See Elaine Louie, *An Italian Master Works His Glass Alchemy*, N.Y. TIMES, June 1 1995, at C4, available at <http://www.nytimes.com/1995/06/01/garden/an-italian-master-works-his-glass-alchemy.html?pagewanted=all&src=pm>.

IV. OWNERSHIP STRUCTURE AND AGENCY COSTS

This Article has claimed that a corporation should have an inherent preference for trade secret over patent, at least in theory. But a corporation is a legal fiction that is controlled by human managers. And there is reason to think that corporate managers might sometimes prefer patent over trade secret, leading to a potential tension between their personal interest and the corporate interest.

This type of conflict of interest implicates so-called “agency costs,” or the issues that arise when the interest of the “agent” diverges from that of her “principal.” For instance, an employee (agent) on a fixed salary might be expected to shirk (or worse) at the owner’s (principal’s) expense.²⁴⁷ Knowing this, the owner might be forced to spend time supervising and standing over the employee to ensure hard work. The time and effort that the owner spends monitoring is one type of agency cost. Agency costs like these are inevitable in the principal–agent relationship, though they can be minimized.

Applying these ideas to the corporation, Michael Jensen and William Meckling published a highly influential article in 1976 that cast shareholders in the role of principal and management (meaning directors, executives and other officers) in the role of agent.²⁴⁸ Jensen and Meckling’s shareholder-focused model dominates corporate law discourse today.²⁴⁹

Despite the hegemonic status of the view that shareholders are the principals in the corporate relationship,²⁵⁰ an alternative perspective would view the corporation itself as the principal, and management as agents of the corporation (not the shareholders).²⁵¹ Among the leading proponents of this corporation-as-principal view are corporate law scholars Margaret Blair and Lynn Stout, and corporate lawyer Martin Lipton.²⁵² And, despite the label

²⁴⁷ E.g., LYNN STOUT, *THE SHAREHOLDER VALUE MYTH* 34–35 (2012).

²⁴⁸ See generally Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. FIN. ECON. 305, 312–30 (1976). Jensen and Meckling’s article is “the most frequently cited article in business academia today.” STOUT, *supra* note 247, at 35.

²⁴⁹ STOUT, *supra* note 247, at 35; Henry Hansmann & Reinier Kraakman, *The End of History for Corporate Law*, 89 GEO. L.J. 439, 440–41 (2001) (describing an “emerging consensus” among corporate law scholars and others that “managers of the corporation should be charged with the obligation to manage the corporation in the interests of its shareholders”).

²⁵⁰ See STOUT, *supra* note 247, at 35.

²⁵¹ *Id.*

²⁵² E.g., *id.* at 33–60; Martin Lipton & Steven A. Rosenblum, *Election Contests in the Company’s Proxy: An Idea Whose Time Has Not Yet Come*, 59 BUS. LAW. 67, 75 (2003); see, e.g., Margaret M. Blair & Lynn A. Stout, *A Team Production Theory of Corporate Law*, 85 VA. L. REV. 247, 248–49 (1999). It bears noting that proponents of the corporation-as-principal view generally confine their analysis to “public” corporations. See, e.g., Margaret M. Blair & Lynn A. Stout, *Specific Investment: Explaining Anomalies in Corporate Law*, 31 J. CORP. L. 719, 726 (2006) (discussing “publicly traded corporations”); Lipton &

“alternative,” the law of Delaware is consistent with the view that the corporation itself is the principal.²⁵³

Without taking a definitive position on which view is normatively or descriptively most accurate, this final Part focuses on the agency costs where the corporation (not the shareholders) is viewed as the principal. Using this frame, the remainder of this Part will analyze how the corporate preference for trade secret might be advanced, or alternatively thwarted, by management, under three prototypical ownership structures: Section A considers the case of the public corporation, where shares are owned by the dispersed public. Section B looks at a mature corporation controlled by a private equity fund. Section C examines the early-stage corporation controlled by a venture capital fund.²⁵⁴

A. Public Corporation

How should we expect the corporate preference for trade secret to play out in the large, publicly traded corporation, such as those traded on the New York Stock Exchange? It would appear that any conflict of interest between management and the corporation on this score should be relatively modest, such that managers of such corporations should generally be expected to loyally cause the corporation to operationalize its preference for trade secret.

Rosenblum, *supra*, at 73 (“The owner of a share of stock stands in a very different relationship to the large public corporation and its business and assets than does the owner of a building or a small private company.”); Blair & Stout, *supra*, at 248–49 (focusing on “the public corporation”). Even so, recent scholarship by Hillary Sale questions whether the definition of a “public” corporation is determined solely by whether its shares are traded on a national exchange. See Hillary A. Sale, *The New “Public” Corporation*, 74 L. & CONTEMP. PROBS. 137, 138 (2011). Furthermore, many corporations go from publicly traded to privately held and back again. See, e.g., Martin Lipton & Steven A. Rosenblum, *A New System of Corporate Governance: The Quinquennial Election of Directors*, 58 U. CHI. L. REV. 187, 223 (1991) (“[T]he corporation taken private in an LBO typically goes public again within a matter of a few years.”). For example, Toys “R” Us went public in 1978, then was taken private in 2005 when two private equity firms, Kohlberg Kravis Roberts & Co. and Bain Capital Inc., and a real estate developer, Vornado Realty Trust, purchased all the shares. Stephanie Clifford & Peter Lattman, *Pressed from All Sides, Toys “R” Us Fights To Reinvent Itself*, N.Y. TIMES, Apr. 7, 2012, at B1, B6. KKR, Bain and Vornado apparently plan to once again bring Toys “R” Us public as soon as market conditions are ripe. *Id.* at B1 (“For nearly two years, Toys “R” Us has waited for the right moment to take itself public.”).

²⁵³ STOUT, *supra* note 247, at 8–9, 24–27; Lipton & Rosenblum, *supra* note 252, at 75 (observing that “the legal principles governing public corporations have developed to impose on directors and managers a duty to act in the best interests of the *corporation*,” not necessarily the shareholders (emphasis in original)). Note that under Delaware’s *Revlon* case, the shareholders’ interest may become paramount in the situation where a board of directors resolves that a public corporation shall put itself up for sale. See STOUT, *supra* note 247, at 30–31 (discussing *Revlon, Inc. v. MacAndrews & Forbes Holdings, Inc.*, 506 A.2d 173 (Del. 1986)).

²⁵⁴ The terms “private equity” and “venture capital” are clarified below. See *infra* Part IV.B–C.

This is not simply out of duty, but also self-interest. A primary concern for managers of public corporations is to keep the share price (or dividend) high and rising over the long run, so that they avoid the "market for corporate control" and remain in their positions.²⁵⁵ If a trade secret maximizes net present value (based on the corporation's discount rate),²⁵⁶ managers should be expected to select it.²⁵⁷

One problem for a public corporation that makes a significant portion of its revenue from trade secrets is that it might appear to the market as a "black box," leading to a discount in the value of its shares. This might indeed happen, at least in the early years. But if a public corporation is profitable, year after year, and decade after decade, public shareholders will surely invest in it, black box or not, and perhaps even squeeze out any discount that existed in the early years.

The signal value of a patent is relatively unimportant to public corporations, because of capital lock-in.²⁵⁸ This is not to say that the signal value is wholly valueless to a public corporation, but merely that it is comparatively less valuable to a public corporation than to other people or entities. Similarly, the signal value of a patent may be relatively under-appreciated by the management of a public corporation, because they can use internally generated cash flow to pay their own compensation.²⁵⁹

The interests of public corporate managers and their corporations appear, therefore, to be generally aligned with regard to the corporate preference for trade secret.

What about shareholders' influence on the public corporation? Some public shareholders could conceivably prefer that the corporation tend toward patent, for instance because they expect a short-term stock price rise when a patent is granted. However, the shareholder base in a publicly traded corporation is by definition large, dispersed, and rationally apathetic. Hence, there is little reason to expect that shareholders can place effective pressure on public corporations that might compromise the corporate preference for trade secret.²⁶⁰

For all of these reasons, theory suggests that management of public corporations should be expected to operationalize the inherent corporate preference for trade secret. And the very limited empirical evidence that exists appears to be consistent with this supposition.²⁶¹

²⁵⁵ See Henry G. Manne, *Mergers and the Market for Corporate Control*, 73 J. POL. ECON. 110, 112 (1965).

²⁵⁶ See Schwartz, *Perpetual*, *supra* note 7, at 786-91.

²⁵⁷ See RICHARD A. BREALEY ET AL., *PRINCIPLES OF CORPORATE FINANCE* 14-15 (9th ed. 2008).

²⁵⁸ See *supra* Part III.A.2.

²⁵⁹ See *supra* Part III.A.2.

²⁶⁰ Hedge funds and other institutional shareholders may indeed be able to apply such pressure. A related situation is a corporation wholly owned by a private equity fund, which is the subject of the next Section. See *infra* Part IV.B.

²⁶¹ See Sichelman & Graham, *supra* note 110, at 178-79.

B. Private Corporation

Now let us consider the case of the mature, private corporation controlled by a private equity (PE) fund. In contrast with a public corporation, with its dispersed shareholder base, such a private corporation has only one or a few shareholders and is controlled by the PE fund manager.

PE funds are typically organized as limited partnerships with a fixed term (commonly ten years). During the early years, they invest in portfolio companies. In the later years, they look to exit those investments, via an IPO, acquisition or otherwise, before the deadline, at which time the fund is liquidated and returns distributed to the investors.

The primary purpose of the mandatory liquidation after a fixed term is to discipline fund managers by requiring them to regularly return to the capital markets to fund new projects.²⁶² And, in practice, the turnaround time is more frequent than ten years, because PE fund managers commonly have several funds going at once. The upshot is that PE fund managers, in order to remain in business and continue to earn a living, must go out and raise fresh capital at least every couple of years, if not more frequently.

How can a PE fund manager convince potential investors to entrust her with their money? Unfortunately, she cannot point to a rising stock price, as the portfolio companies are by definition not publicly traded. One alternative quantitative metric, as we have seen, is patent counts. The signal value of a patent is especially valuable to a PE fund manager.

This could lead to a conflict of interest between the PE fund manager and a portfolio corporation under her control. The corporation has an inherent preference for trade secret, as explained in Part III above. But the controlling party prefers to patent anything and everything, due to her need to signal that her portfolio companies are healthy and vigorous.

The important takeaway is that this conflict of interest might lead to PE-controlled corporations tending to patent inventions, even when trade secret would have been the better choice for the corporation in the long run. The potential thus exists that PE fund managers might convert corporate assets to their own benefit by causing the corporations to patent inventions that could have been kept as trade secrets.²⁶³

Now, one may argue that private corporations can be expected to make the efficient choice between patent and trade secret, even when controlled by a PE fund, because the fund wants to maximize the value of the corporation upon resale. The problem with this argument is that trade secrets are by definition opaque to those outside the corporation, leading to an information asymmetry that may easily cause the corporation to make an inefficient choice.

²⁶² See RIBSTEIN, *supra* note 191, at 212.

²⁶³ From the perspective of the corporation-as-principal, this would be inappropriate, even if all of the shareholders and all of the managers were in favor of it. See generally Jensen & Meckling, *supra* note 248.

This makes intuitive sense. A corporation may have a great invention that can be protected by patent or trade secrecy. If patent is chosen, then the market can analyze the invention and value it. If trade secret is chosen, however, then the market can never fully understand the invention and may therefore err on the side of undervaluing it. To obtain full credit in the market, the corporate invention might be patented, even if trade secrecy might have been the better choice in the absence of the information asymmetry. All the more so in the relatively short time frame (ten years or less) that a PE fund works with.

Hence, the idea that PE fund managers should prefer the value-maximizing choice so that they can sell their shares to others in the future at a good price does not apply to the patent/trade secret decision. The nature of trade secrecy is that there will always be an information asymmetry, so the shareholders cannot count on getting full value when they go to sell their shares in the marketplace. Indeed, the very function of the patent signal is that it helps ameliorate this valuation problem.

Theory thus suggests that corporations controlled by PE funds may have their inherent preference for trade secret effectively overruled by the controlling party.²⁶⁴ This conflict of interest between PE fund managers and their portfolio corporations has not been previously recognized.

C. Startup Corporation

The final ownership structure to be considered is that of an early-stage corporation controlled by a venture capital (VC) fund. VC funds are similar to the private equity funds just discussed. Like PE funds, VC funds have limited lives, commonly ten years, and they try to make investments in the early years, then exit those investments before time runs out. And VC fund managers, like their PE fund analogs, must almost constantly raise capital for new funds. The key difference between PE and VC funds, for present purposes at least, is that PE funds invest in mature companies, while VC funds invest in early-stage startup companies.

Just as we saw in the context of PE funds, VC funds may also be expected to pressure or cause their portfolio corporations to push for patent over trade secret to benefit themselves. VC funds, perhaps even more than PE funds, measure and tout themselves based on the patents held by their underlying portfolio companies.²⁶⁵ Patents can be used as “currency” to measure the value of a company and persuade potential investors to hand money over to a given

²⁶⁴ Or, at least, the corporate preference for trade secrecy should be lessened when a corporation is controlled by one or more PE funds. *See supra* Part III.B.

²⁶⁵ Sichelman & Graham, *supra* note 110, at 122–23 & n.56; Lemley, *Reconceiving*, *supra* note 121, at 143 (“[I]f you ask them how their companies are doing in the marketplace, they will answer you with reference to patents: ‘Our company has patented this model’; ‘our company got twelve patents this year’; ‘our company has patent applications that cover this, that, and the other thing.’”).

VC fund manager.²⁶⁶ A high patent count is one important way that a VC fund can increase the valuation of a portfolio company at the time of its exit.

There is evidence that these theoretical insights play out in practice. A study by the National Bureau for Economic Research, for instance, found that the amount of venture capital in an industry and the level of patenting in that industry are directly correlated.²⁶⁷ And the recent Berkeley Law study reported that VC-backed companies are keenly aware of the importance of “securing investment and liquidity events” when selecting between patent and trade secret.²⁶⁸

So, there is reason to think that VC fund managers may, like their PE fund brethren, tend to cause their portfolio corporations to select patent over trade secret. This may be less of a conflict of interest in the VC context than it was in the PE context, however.

Corporations backed by VC funds are in their first years of existence. At that stage of corporate development, internally generated revenues are likely insufficient to support an appropriate level of expansion and growth. Even with capital lock-in, the early stage corporations that VC funds invest in will commonly need a great deal of outside capital for the first few years. By contrast, the mature companies financed by PE funds are more likely to be able to fund efficient projects without having to seek outside financing.

The point is that, despite the general corporate preference for trade secret, during the earliest stages of the corporation’s existence, it may prefer patent so that it can better attract outside capital to help it ultimately achieve sustainable profitability. Once the corporation reaches “escape velocity,” and can fund projects out of internally generated cash, then it should prefer trade secret, for all the reasons discussed in Part III above.

Furthermore, for less established corporations, patents might serve an especially powerful signaling function that does even more than simply credibly signaling the depth of their intellectual property reserves. The fact that a startup was able to navigate the significant administrative and financial challenges of the patent acquisition process may signal positive things about the overall stability and legitimacy of the organization in matters that have nothing to do with IP. This effect is less important for older, well-known corporations, whose reputation already precedes them.

At bottom, VC fund managers may push their portfolio corporations to select patent over trade secret. Although that would appear to conflict with the corporate preference for trade secret over patent, it may actually align with the corporate interest.

²⁶⁶ See Moore, *supra* note 120, at 1545–52; Foster, *supra* note 120.

²⁶⁷ Samuel Kortum & Josh Lerner, *Does Venture Capital Spur Innovation?* 3 (Nat’l Bureau of Econ. Research, Working Paper No. 6846, 1998), available at <http://www.nber.org/digest/may99/w6846.html> (“Venture-backed firms may . . . patent more of their innovations because they . . . seek to impress potential investors . . .”).

²⁶⁸ Sichelman & Graham, *supra* note 110, at 157.

V. CONCLUSION

Corporations should prefer trade secret over patent, when the option is reasonably available, for reasons related to the fundamental legal nature of the corporate form. But there is reason to expect that corporate managers might sometimes wish for their corporations to select patent whenever possible, creating a potential conflict of interest. How to minimize this agency cost may be a fruitful subject for future work.